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REVISION OF THE *TERELLIA VIRENS* GROUP (DIPTERA, TEPHRITIDAE) WITH DESCRIPTION OF THREE NEW SPECIES

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Revision of the *Terellia virens* Group (Diptera, Tephritidae) with Description of Three New Species. Korneyev V. A., Evstigneev D. A., Karimpour Y., Kütük M., Mohamadzade Namin S., Ömür Koyuncu M., Yaran M. — The *Terellia virens* group includes eight species of uniformly greenish flies with white setulose abdomens and hyaline wings, variable in the characters of the male and female terminalia. Three new species are described and illustrated: *Terellia freidbergi* sp. n. from Middle and Near East, from flower heads of *Centaurea behen* L., *T. ivannikovi* V. Korneyev et Evstigneev, sp. n. from European Russia, Kazakhstan and Uzbekistan, breeding in flower heads of *Ce. chartolepis* Greuter, and *T. whitei* V. Korneyev et Mohamadzade, sp. n. reared from flower heads of *Cousinia* spp. in Kazakhstan, Kyrgyzstan, Turkmenistan and Iran. Illustrated diagnoses or redescriptions of other species and a key to the species of *Terellia* with hyaline wings and white setulose abdominal tergites are given.

Key words: Diptera, Tephritidae, Terelliini, *Terellia*, key, new species, Palaearctic Region, *Centaurea*, *Cousinia*.

Ревизия группы видов *Terellia virens* (Diptera, Tephritidae) с описанием трёх новых видов. Корнеев В. А., Евстигнеев Д. А., Каримпур Ю., Кютюк М., Мохамадзаде-Намин С., Эмюр-Коюнчу М., Яран М. — Группа *Terellia virens* включает в себя 8 видов однообразно зеленоватых мух с прозрачными крыльями и беловолосистым брюшком, отличающихся строением гениталий самцов и самок. Описаны *Terellia freidbergi* sp. n. со Среднего и Ближнего Востока, выведенная из соцветий *Centaurea behen* L., *T. ivannikovi* V. Korneyev et Evstigneev, sp. n. из Европейской России, Казахстана и Узбекистана, развивающейся в соцветиях *Ce. chartolepis* Greuter, и *T. whitei* V. Korneyev et Mohamadzade, sp. n. связанная с соцветиями *Cousinia* spp. в Казахстане, Кыргызстане, Туркменистане и Иране. Представлены также иллюстрированные переописания других видов и определительная таблица видов рода *Terellia* с прозрачными крыльями и беловолосистыми тергитами брюшка.

Ключевые слова: Diptera, Tephritidae, Terelliini, *Terellia*, таблица для определения видов, новый вид, Палеарктика, *Centaurea*, *Cousinia*.

Introduction

The fruit flies of the tribe Terelliini are small to medium-sized (wing length 2.5–7.5 mm) yellowish flies associated with various plants of the family Asteraceae. They occur mainly in the Palaearctic Region, except for three species in the Nearctic Region (two native and one introduced species), 3–4 species in the Oriental Region and 8–9 species in the Afrotropical Region (Norrbom et al., 1999). Approximately 80 species of the tribe are distributed among the rather small genera *Craspedoxantha*, *Chaetorellia*, *Chaetostomella* and *Orellia*, and the largest genus *Terellia* Robineau-Desvoidy has some 50 species. The tribal position of the Nearctic genus

Neaspilota Osten Sacken usually assigned to this tribe (Freidberg, Mathis, 1986) is disputable (Korneyev, 1999; Han et al., 2006) and we do not consider it here.

This paper concerns one of the most important groups of species that contains hyaline-winged flies with mostly whitish setulae on the abdominal tergites and an apically blunt aculeus; they are associated with knapweeds, starthistles (*Centaurea*) and a few related genera of composite plants.

The concept of the genus *Terellia* originally established for a few yellow-bodied tephritoids with hyaline wings (Robineau-Desvoidy, 1830; Macquart, 1835), later having been restricted to include only species with white setose abdominal tergites (Hendel, 1927; Séguy, 1934; Richter, 1970).

Korneyev (1985) and then White (1989) showed that the Western Palaearctic "*Terellia virens*" is, in fact, a group of three closely related cryptic species, *T. virens* Loew, *T. zerovae* Korneyev, and *T. uncinata* White, which differ only by the details of male terminalia and the host plant associations and had been confused previously. This conclusion was very important, as *T. virens* was considered a prospective agent for the biological control of diffuse and spotted knapweed in Canada and the USA (Groppe, Marquardt, 1989) and it was later successfully released there.

Subsequently, several additional species very similar to *T. virens* in having hyaline wings and white setulose abdomens were described (Korneyev, 1987, 1988, 1989, 1990; Korneyev, Merz 1996), but since the key to species groups (Korneyev 1985), no comprehensive keys to species have been published except for an improved key to the subgenus *Cerajocera* (Korneyev, 2003) and to the *Terellia quadratula* group of species (Korneyev, 2006).

Material and methods

As part of a revision of the Terelliini, started by the first author in the 1980s, a large number of specimens have been collected in Middle Asia and Ukraine, and many specimens were found in the major collections of European countries and the USA. New material from the Volga Region of European Russia, was collected by DAE, from Iran by YK and SMN, and from Turkey by MK, MY and MÖK in 2001–2012.

During 1995–2006, additional specimens of *Terellia* were examined in the following collections:

BMNH — The Natural History Museum, London, United Kingdom; CDE — personal collection of Dmitry Evstigneev, Ulyanovsk, Russia; GUGT — Department of Biology, Faculty of Science and Arts, Gaziantep University, Gaziantep, Turkey; IAUV — Islamic Azad University, Varamin-Pishva Branch; MHNG — Museum of Natural History, Geneva, Switzerland; MMBC — Moravian Museum, Brno, Czech Republic; NMPC — National Museum (Natural History), Prague (Kunratice), Czech Republic; MNHN — Muséum National d'Histoire naturelle, Paris, France; NHMW — Naturhistorisches Museum, Wien, Austria; RMNH — Nationaal Natuurhistorisch Museum Naturalis, Leiden, the Netherlands; SIZK — I. I. Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine, Kyiv, Ukraine; SMNC — personal collection of Saeed Mohamadzade Namin; TAUI — Tel Aviv University, Israel; USNM — National Museum of Natural History, Washington, D.C., USA; YKC — personal collection of Y. Karimpour; ZISP — Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia; ZMHB — Naturkunde Museum Berlin, Germany; ZMUM — Zoological Museum of M. V. Lomonosov State University in Moscow, Russia.

This paper does not cover most of the vast material of *Terellia virens* Loew from Europe accumulated in various European collections, which has been briefly reviewed by White (1989).

External characters were examined and photographed using various dissecting binocular microscopes. Terminalia were macerated in 10 % potassium hydroxide and washed in distilled water, and digital photographs were made from temporary slides in glycerol under a Wild M11 compound binocular microscope. Photographs were taken with a digital camera. The detached parts were placed in plastic microvials with glycerol after examination, closed with a stopper, and pinned beneath the respective specimens. Combine ZM (Hadley, 2007) was used to assemble serial photographs into one sharp image.

Terminology

Morphological terminology was generally adopted from White et al. (1999), except for a few details of the phallic glans and aculeus explained directly in the text. The descriptions and pictures of male terminalia relate to the 'upright' position, in which the proctiger is in the dorsal position, rather than in the inverted ventral position.

The following characters with their abbreviations are used for each species: head ratio (HR = head length: head height: head width); wing length (WL); aculeus length (AL); apicodorsal rod (adr); basal portion of the acrophallus (ba); corolla-like sclerites of the acrophallus (cs); tubular projections of acrophallus (tap). The measurements are used as additional characters only.

Results

Terellia virens group of species

Korneyev, 1985: 629 (as group of species; key to groups); Bassov, Nartshuk, 1996: 220 (as subgenus *Whitterellia* Bassov et Nartshuk; type species: "*Trypeta virens* Loew, 1847[sic!]").

Species of the *virens* group are superficially similar to numerous species of *Terellia*, which have a similar external appearance (greenish yellow body, hyaline wing, white setulose abdomen), which has been shown either subject to homoplasy (hyaline wing) or characters of unclear phylogenetic polarity (white setulose abdomen), so they cannot be differentiated by external characters from similar *Terellia* species without dissection of terminalia and are often misidentified in collections. We therefore give a key to all *Terellia* species with hyaline (or mostly hyaline) wings and white setulose abdominal tergites 3–5 (–6) to facilitate identification of such species. We provide below a brief review of species belonging or similar to species of the *virens* group, which do not fit the concept of this group entirely, but cannot be differentiated on the basis of external characters alone.

Key to *Terellia* Species with Hyaline Wings and White Setulose Abdominal Tergites

Таблица для определения видов *Terellia* с прозрачными крыльями и беловолосистыми тергитами брюшка

1. Abdominal tergites 1–6 of female and 1–4 of male white setulose, at most tergite 5 of male with a few brownish setulae posteromedially. 2
— At least abdominal tergites 5–6 of female and 4–5 of male widely brown or black setulose. Wings either banded, or spotted, or, rarely, hyaline. ..... *Orellia*, *Chaetostomella*, *Chaetorellia* and *Terellia* (part)
2. Wing with at least one yellow or brown spot distal of stigma. 3
— Wing entirely hyaline, except yellow stigma. 4
3. Wing with 2 narrow crossbands: one from anterior margin through DM-Cu crossvein and other along anteroapical margin; mesonotum with 2 widely fused, very broad vittae and both dorsocentral and acrostichal setae inserted in black field; abdominal tergites matt, with 2 pairs of small black spots at anterior margin; each posterolateral margin of male tergite 5 with black dot. WL = 4.5–5.0 mm. India, Nepal. ..... *T. tribulicola* Senior-White
— Wing with 2 or 3 large yellow spots distal of R_1 apex; mesonotum with wide black anteromedial and 2 narrowly separated posterolateral vittae; both dorsocentral and acrostichal setae inserted in yellow field; abdominal tergites shining yellow, with 1 medial pair of rows of shining black spots, large in female (half as long as tergite on tergites 4–6); and much smaller in males; tergite 5 of male with anterior pair of spot only: posterolateral margin uniformly yellow. WL = 4.5–5.5 mm. Middle Asia, SE of European Russia. ..... *T. amberboae* Korneyev et Merz
4. Abdominal tergite 3 with 2 pairs of large black spots (fig. 1, *3*, *7*). ..... 5.
— Abdominal tergite 3 with 1 submedial pair of small black spots (fig. 1, *4–6*; *8–10*). ..... 7.
5. Pleura with longitudinal stripes: dorsal one-third or quarter of pleura contrast banded: light grey, greenish or bluish, or light yellow in old specimens, and ventral portion contrasting darker grey or brownish. Palpus long, usually extending beyond anterior margin of oral cavity, orange to black at apex. Eye in live specimens usually with longitudinal band. Medium-sized or large species: WL ♂ > 4.0 mm, WL ♀ > 4.5 mm. ..... *T. serratulae* group of species
— Pleura uniformly greenish yellow (fresh specimens) or brownish yellow (dry specimens). Abdominal tergite 3 with 1 submedian pair of black spots or entirely yellow. Palpus shorter, not extending beyond anterior margin of oral cavity, uniformly yellowish. Eye in live specimens uniformly greenish. Aculeus rounded at apex. WL variable. ..... 6.
6. Male abdomen: tergite 5 with 3 pairs of separate spots. Female abdomen with 2 pairs of smaller separate black spots on tergites 5 and 6. Oviscape at least as long as 4 posteriormost abdominal tergites. Phallus glans short: acrophallus entirely reduced, apicodorsal rod large, apically fan-like dilated (see Korneyev, 1985: fig. 27; 1989: fig. 6). Female postabdomen: ventral lobes far not reaching apex of aculeus; apex as long as or longer than distance between lateral setae. Spermatheca with narrow neck. Medium-sized species: WL ♂ > 4.5 mm, WL ♀ > 5 mm. ..... *T.* (*Cerajocera*) spp. (part)
— Male abdomen: tergite 5 with long triangular lateral spot almost reaching posterior margin (fig. 1, *3*). Female abdomen with 2 pairs of large, partially fused black spots on tergites 3–6 (fig. 1, *7*). Oviscape slightly longer than tergites 4–6. Phallus glans with short paired tubular projections of acrophallus entirely hidden inside preputium (fig. 2, *6*: *tap*). Female postabdomen: ventral lobes almost reaching apex of aculeus; apex strongly transverse: distance between lateral setae 3.5–4 times as long as distance between level of basal lateral seta and aculeus apex (fig. 9, *7*). Spermatheca with long dilated neck (fig. 9, *8*). Smaller species: WL < 4.0 mm. ..... *T. odontolophi* Korneyev
7. Abdominal tergite 5 of male without posterolateral dark spots (fig. 1, *4*; 10, *2*). Glans with short semitubular sclerites of acrophallus (fig. 10, *6*). Aculeus pointed to apex (fig. 10, *7–8*). Prescutellar acrostichal seta without distinct shining spot at base (fig. 10, *1*). ..... *T. orheana* Korneyev
— Abdominal tergite 5 of male with posterolateral dark spots (fig. 1, *5–6*; 6, *4*). Glans with long sclerites of acrophallus (fig. 2, *1–5*). Aculeus bluntly rounded at apex (fig. 4, *3*; 5, *6*; 7, *5*; 8, *8*). Prescutellar acrostichal seta with large shining spot at base (fig. 3, *5*; 5, *2–3*; 7, *3*; 8, *2*).
***Terellia virens* group of species**: 8

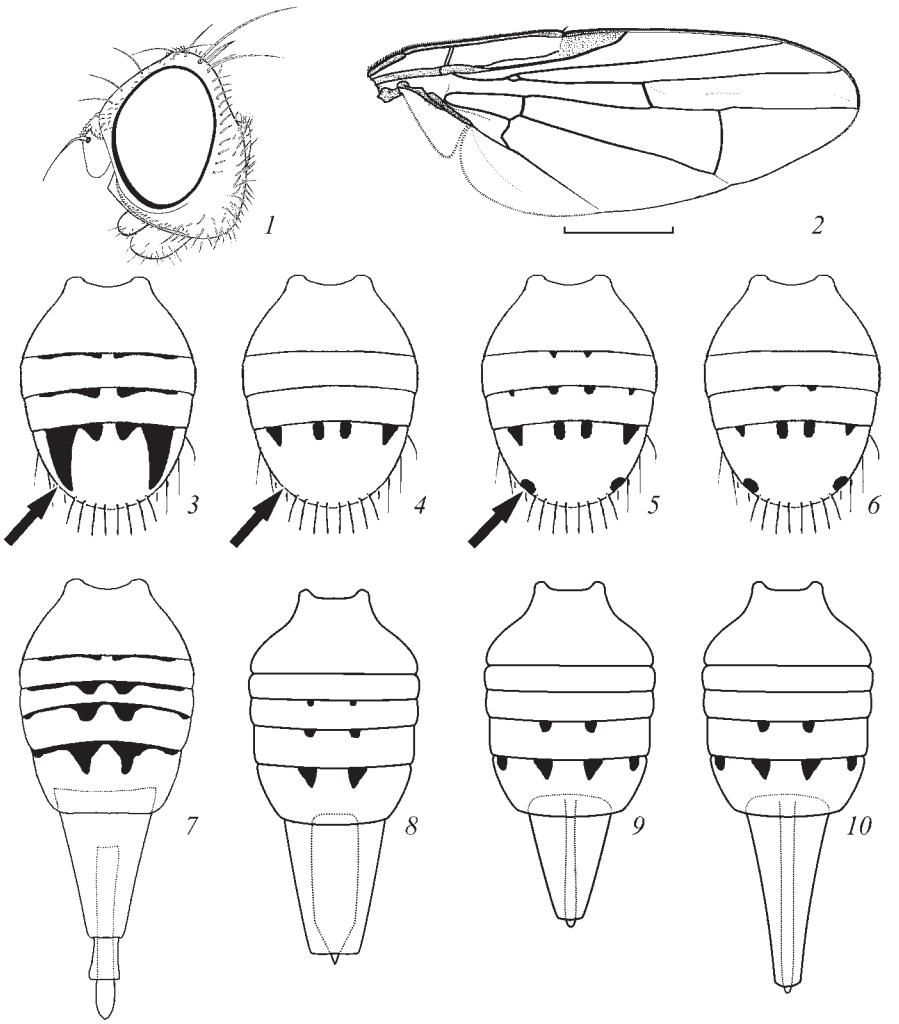

Fig. 1. *Terellia ivannikovi* sp. n. (*1*, *2*), *T. odontolophi* (*3*, *7*), *T. orheana* (*4*, *8*), *T. uncinata* (5, 9), *T. freidbergi* sp. n. (*6*, *10*): *1* — head, lateral; *2* — wing; *3–6* — male abdomen; *7–10* — female abdomen.

Рис. 1. *Terellia ivannikovi* sp. n. (*1*, *2*), *T. odontolophi* (*3*, *7*), *T. orheana* (*4*, *8*), *T. uncinata* (5, 9), *T. freidbergi* sp. n. (*6*, *10*): *1* — голова, сбоку; *2* — крыло; *3–6* — брюшко самца; *7–10* — брюшко самки.

8. Larger species: WL usually more than 4.0 mm (♂: 4.0–4.8; ♀: 3.8–4.8). Male terminalia: glans with elongate tubular acrophallus apically bifurcated into pair of short semitubular structures without corolla-like sclerites surrounding them (fig. 2, *1–2*); surstylus with subequal claw-like prensisetae and short anteroventral lobes (fig. 4, *2*; 5, *5*). Female terminalia: oviscape longer than tergites 3–6 combined (fig. 1, *10*; 3, *4*); aculeus long and narrow (fig. 4, *3*), AL > 1.5 mm. 9
— Smaller species: WL usually less than 4.0 mm (♂: 2.5–3.9; ♀: 3.0–4.0). Male terminalia different: glans with elongate tubular acrophallus apically enclosed into paired cup-like sclerites surrounding them (fig. 2, *3–5*); surstylus with one smaller, thin and one larger prensisetae on each (fig. 6, *8*) or with subequal claw-like prensisetae and long anteroventral lobes (fig. 8, *5*). Female terminalia: AL < 1.5 mm. 11
9. Mesonotum with reddish-yellow lyrate pattern (fig. 3, *5*, *8*). Glans: acrophallus basal part (ba) less than 2 times as long as sclerotized apico-dorsal rod (adr) (fig. 2, *1*). In *Centaurea behen*. Turkey; Armenia; Iran, Syria, Israel. ..... *T. freidbergi* sp. n.
— Mesonotum with black or brown lyrate pattern (fig. 5, *2–3*). Glans: acrophallus basal part (ba) more than 3 times as long as sclerotized apico-dorsal rod (adr) (fig. 2, *2*). In *Centaurea chartolepis*. European Russia, Kazakhstan, Uzbekistan. ..... *T. ivannikovi* sp. n.
10. Male terminalia: glans with short bifurcated acrophallus without cup-like structures (fig. 8, *6–7*); epandrium with subequal claw-like prensisetae and long anteroventral lobes (fig. 8, *4–5*). Female terminalia: oviscape as long as, or slightly longer than tergites 3–6 combined (fig. 1, *10*); aculeus long and nar-

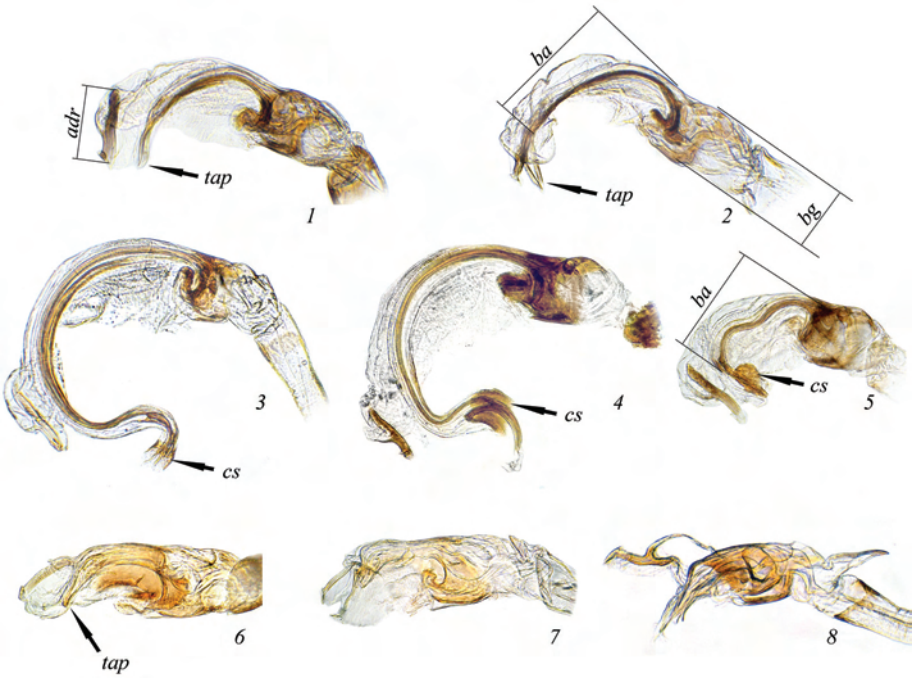

Fig. 2. *Terellia*, glans of phallus, left: *1 — T. freidbergi* sp. n.; *2 — T. ivannikovi* sp. n.; *3 — T. virens*; *4 — T. uncinata*; *5 — T. zerovae*; *6 — T. odontolophi*; *7 — T. orheana*; *8 — T. whitei.*

Рис. 2. *Terellia*, гланс фаллюса, слева: *1 — T. freidbergi* sp. n.; *2 — T. ivannikovi* sp. n.; *3 — T. virens*; *4 — T. uncinata*; *5 — T. zerovae*; *6 — T. odontolophi*; *7 — T. orheana*; *8 — T. whitei.*

row, AL > 1.1 mm (figs. 8, *8–9*). In *Cousinia* spp. Kazakhstan, Kirghizstan, Uzbekistan, Turkmenistan, Iran. ..... *T. whitei* sp. n.

— Male terminalia: glans with elongate tubular acrophallus apically enclosed into corolla-like sclerites surrounding them (fig. 2, *3–5*); epandrium with one smaller and one larger prensisetae on each surstylus (fig. 6, *7–8*). Female terminalia: oviscape shorter than tergites 4–6 combined (fig. 1, *9*); aculeus shorter and wider, AL < 1.0 mm. In *Centaurea* spp. 11

11. Glans with moderately long acrophallus: its basal part (ba) less than twice as long as sclerotized apico-dorsal rod (*adr*) (fig. 2, *5*). In *Centaurea* (*Calcitrapa*) spp. and *Ce.* (*Acrolophus*) *squarrosa*. Turkey to Kyrghizia. ..... *T. zerovae* Korneyev

— Glans with long, sinuate acrophallus: its basal part (ba) more than 3.5 times as long as sclerotized apico-dorsal rod (*adr*) (fig. 2, *3–4*). In *Centaurea* (*Acrolophus*) spp. and *Ce.* (*Solstitiaria*) spp. Europe, to Middle East and Egypt. 12

12. Acrophallus with large corolla-like sclerites (cs) as long as sclerotized apico-dorsal rod (adr) (fig. 2, *4*). Mainly in *Centaurea* (*Solstitiaria*) spp. Italy, Asia Minor, Iran. ..... *T. uncinata* White

— Acrophallus with smaller corolla-like sclerites (cs) half as long as sclerotized apico-dorsal rod (adr) (fig. 2, *3*). Mainly in *Centaurea* (*Acrolophus*) spp. Europe (except North), Israel, North Africa. .... *T. virens* (Loew)

The *virens* group of species

Diagnosis. Medium-sized or moderately small flies with hyaline, non-spotted wings, greenish-yellow (brownish-yellow in dead specimens) body, non-striate compound eye and pleura, white setulose abdominal tergites, male tergite 5 with pair of round black posterolateral spots, glans of phallus with long acrophallus, aculeus with blunt, rounded apex; spermatheca with slightly dilated and very sparsely wrinkled neck.

Description. Head (fig. 1, *1*; 3, *2*; 8, *3*) yellow, slightly higher than long; compound eye in live specimens uniformly greenish, without longitudinal stripe; gena at least as high as flagellomere 1 width; antenna without modifications, flagellomere 1 bluntly round-

ed at apex, approximately 1.5 times as long as wide, arista very short pubescent; palpus short, pale yellow, not extending beyond anterior margin of oral cavity.

Thorax greenish yellow (in dead specimens brownish yellow), with uniformly colored anepisternum; mesonotum (fig. 3, *5*, *8*; 7, *3*) with black or reddish brown lyrate pattern, nearly obscured by moderately thick microtrichia and white setulae; dorsocentral seta on yellow, or rarely on dark field, with pale brown dot at base; acrostichal seta usually with black spot at base; scutellum uniformly pale yellow, matt, without black spots or dots.

Wing (fig. 1, *2*; 3, *1*, *3*; 7, *2*) entirely hyaline, with yellowish pterostigma; posteroapical lobe of cell bcu short.

Abdomen (fig. 3, *6*, *8*; 6, *4*; 7, *4*) greenish yellow (brownish yellow in dead flies), with submedian pair of shining black spots at anterior margin of tergites 3–5 (–6 in female), lateral pair of smaller black spots at anterior margin of tergites 4–5 (–6 in female), often hidden underneath posterior margin of preceding tergite, and lateral pair of round black spots closer to posterior margin of tergite 5 in male; all tergites subshining, white setulose, except a few posteromedial brown setulae on tergite 5 of male (fig. 6, *4*) and tergite 6 of female (fig. 7, *4*); tergites 4–6 with brown marginal setae; sternite 5 of male wider than long, shallow incised at posterior margin, bearing brownish yellow marginal setae almost as long as sternite; female sternites 5 and 6 with rather wide antero-medial apodemes.

Male terminalia: hypandrium with smooth bottom; basiphallus short, moderately produced posteriorly; glans with long acrophallus having basal tube at 1.5–2 times as long as sclerotized apico-dorsal rod, in *T. uncinata*, *T. virens* and *T. zerovae* acrophallus enclosed into tunica-like membranous structure bearing apical corolla-like symmetric sclerite surrounding apical semitubular filaments and bearing claw-like spurs and numerous papillae on its inner surface; epandrium typical for terelliines, elongate oval, with moderately elongate surstyli (fig. 4, *2*; 5, *4*; 6, *7*; 8, *4*); lateral surstylus clearly bilobate at apex; anterior (ventral) lobe subquadrate, often with papillose sculpture on dorsal surface, usually bearing 3–4 mesally directed setulae, posterior lobe slightly shorter than anterior, rounded, with 4–6 setulae; medial surstylus with 5–7 longer setulae on mesal surface and 2 groups of 2–3 short setulae close to prensisetae; prensisetae subequal, claw-like (in *T. freidbergi* sp. n) or unequal, one large, somewhat flattened, incisor-like, other small, peg-like (in *T. uncinata*, *T. virens* and *T. zerovae*).

Female terminalia: tergosternite 7 dorsoventrally flattened, as long or longer than tergites 4–6 combined, uniformly yellow or with pair of brown antero-dorsal spots, brown setulose; eversible membrane with moderately short taenia and blunt round scales; aculeus moderately long (0.8–1.0 as long as pterostigma), moderately sclerotized in basal 0.8, blunt and stronger sclerotized at apex; ventral lobes (sternite 8) rather soft, with several short trichoid sensilla over its length; apex (cercal portion) of aculeus short, distance from apices of ventral lobes to aculeus apex less than aculeus width (at level of apices of ventral lobes); apex with numerous and uniform placoid sensilla (pore-like in transmission microscope), 2 or 3 laterally directed hair sensilla; spermatheca short, papillose, with slightly dilated, but neither thickened, nor densely wrinkled neck.

Included species. *Terellia freidbergi* sp. n., *T. ivannikovi* Korneyev et Evstigneev, sp. n., *T. uncinata* White, 1989, *T. virens* (Loew, 1846), *T. whitei* Korneyev et Mohamadzade, sp. n., and *T. zerovae* Korneyev, 1985. Two additional species considered below, *T. odontolophi* Korneyev, 1993 and *T. orheana* Korneyev, 1990 superficially resemble the species of the *virens* group but have some important differences from them and apparently belong elsewhere.

Distribution. Western part of the Palaearctic Region easternmost to Kyrgyzstan and Afghanistan.

Discussion. Relationships among the species of this and other groups (e. g., *megalopyge* group, *colon* group, *blanda* group, some ungrouped species) remain unclear and

hardly have any solutions based on morphological characters alone, as they are highly subject to homoplasy. We therefore neither make any phylogenetic conclusions nor apply the subgeneric name *Witterellia* Bassov et Nartshuk, 1996 to this group until their phylogenetic relationships are properly analyzed on the basis of both molecular and morphological data.

Terellia freidbergi **sp. n.** (fig. 2, *1*; 3, 4)

Korneyev 1988: 874 (*Terellia* sp.) (record from Armenia). — Korneyev, Dirlbek, 2001: 466 (*Terellia* sp. ex *virens* group) (record from Syria).

Material. **Type**: Holotype ♂: **Israel**: Har Kena'an nr Zefat, "5238", 26.05.1999 (Freidberg) (TAUI). Paratypes: **Armenia**: Vedi, 3.06.1982, 1 ♀ (Ermolenko); idem, Khosrov Natural Reserve, juniper and maple woods on slopes, 27.06.1982, 2 ♀ (dissected) (Ermolenko) (SIZK); **Iran**: 5 ♂, 5 ♀: Urmia, ex flower heads of *Centaurea behen*, coll. autumn 2008 — exit 22.04–9.05.2009; idem, 7 ♂, 3 ♀ (1 ♂ and 1 ♀ dissected), 22.04.2009 — exit 6.05.2009; idem, 3 ♂, 4 ♀, ex flower heads of *Centaurea* sp. 1, 22.04.2009 — exit 6.05.2009 (Karimpour) (SIZK, YKC); 5 ♂, 7 ♀, Tehran Province: Haraz road, 7 km NE Abali, 2360 m, 35°50.304' N, 51°58.980' E, from flower heads of *Ce. behen*, 13.09.2008 — exit 26.09.2008; 2 ♂, 4 ♀, idem, from flower heads of *Ce. behen*, 30.08.2007 — exit 15.09.2007; 1 ♀, Alburz Province: Taleghan, Zidasht, 1900 m, 36°09.941 N, 50°42.785 E, from flower heads of *Ce. behen*, 07.07.2008 — exit: 18.07.2008; 2 ♀, Kurdistan

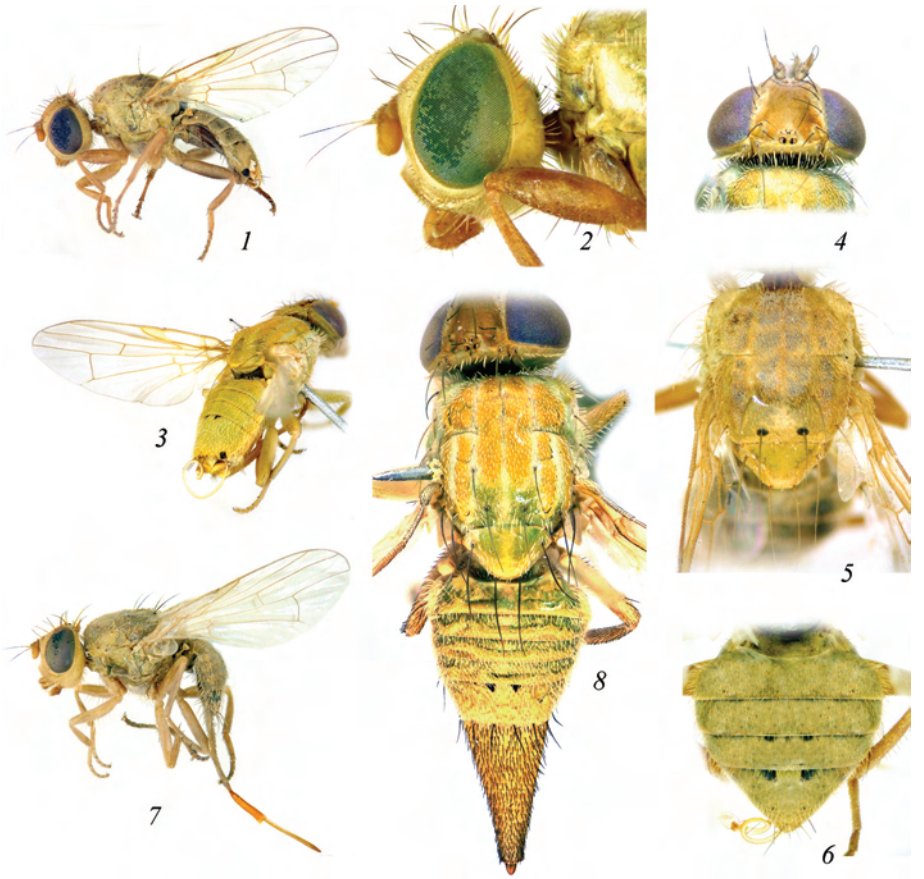

Fig. 3. *Terellia freidbergi* sp. n.: *1* — holotype ♂, total left view; *2* — same, head left; *3* — paratype ♂, Iran, right and posterior; *4* — paratype male, Iran, head, dorsal; *5* — holotype, mesonotum, dorsal; *6* — paratype, abdomen, dorsal; *7* — paratype female, Israel, lateral; *8* — paratype female, Iran, mesonotum and abdomen, dorsal view.

Рис. 3. *Terellia freidbergi* sp. n.: *1* — голотип ♂, общий вид слева; *2* — то же, голова, слева; *3* — паратип ♂, Иран, справа и сзади; *4* — паратип ♂, Иран, голова сверху; *5* — голотип, среднеспинка сверху; *6* — паратип, брюшко, сверху; *7* — паратип ♀, Израиль, сбоку; *8* — паратип ♀, Иран, среднеспинка и брюшко, вид сверху.

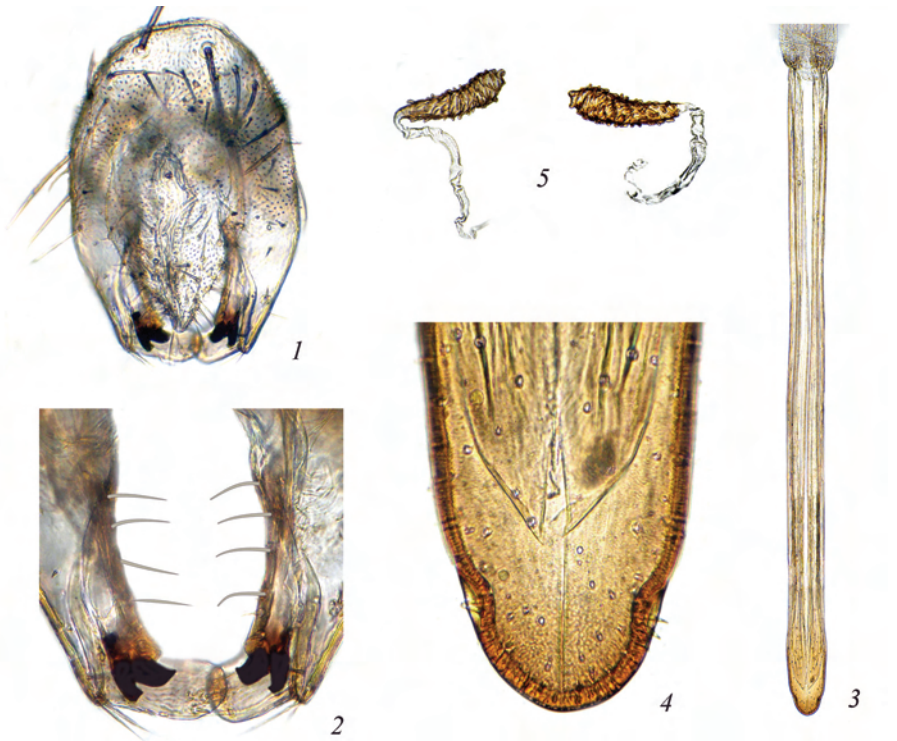

Fig. 4. *Terellia freidbergi* sp. n.: *1* — epandrium; *2* — surstyli, enlarged; *3* — aculeus; *4* — aculeus apex, enlarged; *5* — spermathecae.

Рис. 4. *Terellia freidbergi* sp. n.: *1* — эпандрий; *2* — сурстили, увеличено; *3* — акулеус; *4* — вершина акулеуса, увеличено; *5* — сперматеки.

Province: Marivan, Dezli, Uraman, 1700 m, 35°19.655' N, 46°11.316' E, swept from *Ce. behen*, 06.06.2009; 2 ♀, Sanandaj, 20 km W Bijar, from flower heads of *Ce. behen*, 20.07.2009 — exit 02.08.2009 (Mohamadzade) (IAUV; SMNC); **Israel**: 4 ♂, 3 ♀ (1 ♂ and 1 ♀ dissected), Har Kena'an nr Zefat, 26.05.1999 (Freidberg) (TAUI; SIZK); **Turkey**: 1 ♂, Hakkari, Yüksekova Plain, 10 km W of Yüksekova, 1700 m, 4.08.1983 (Lucas) (RMNH) (dissected); 4 ♂, 4 ♀, Gaziantep, Araban, Beydilli village, 37°30' N, 37°39' E, 910 m, 16.06.2009, 2 ♂, 3 ♀, idem, 37°30' N, 37°39' E, 910 m, 22.06.2010; 1 ♂, 2 ♀, idem, Center, Yıldız village, 37°14' N, 37°15' E, 859 m, 12.06.2010 (Kütük, Yaran and Ömür Koyuncu) (GUGT). **Examined specimens not included in the type series**. **Syria**: Mayadin, 15–18.05.1960, 1 ♀ (Malkawi) (NMPC); **Iran**: E: 55 km S Hadjiabad, 2000 m (loc. nr. 195), 10.05.1973, 1 ♀; S: "Mian Jangal" (loc. nr. 223), 30.05–5.06.1973, 1 ♀ (2nd Czechoslovak-Iranian Entomological Expedition) (NMPC).

Description. Head (fig. 3, *2*, *4*). HR 1 : 1.26 (1.14–1.38) : 1.76 (1.63–1.89). Ocellar triangle yellow. Compound eye vertical: horizontal diameter ratio 1.4 (1.2–1.5). Eye: gena height ratio 5.3 (4.7–5.6). Setulae all white. Setae yellow to brownish yellow; genal seta slightly darker than surrounding setulae.

Thorax 0.85 times as wide (between postpronotal lobes) as head. Scutum 1.15–1.22 times as long as wide (between presutural supraalar setae), uniformly greenish yellow (in specimens from Armenia), or with orange to reddish lyrate pattern and brown spots at bases of acrostichal seta. Scutellum slightly wider than long, with 9–15 white setulae on each margin. Pleura uniformly yellow or katepisternum and meron with 2 reddish spots poorly visible through sparse whitish microtrichia. Metatergite black, whitish microtrichose, except shining spot at middle.

Legs uniformly yellow; brownish setose and setulose, except fore femur with 2 dorsal rows of white setae in basal 0.8 of its length.

Wings. Hyaline, with yellowish pterostigma.

Abdomen. Male: tergites 3 and 4 with pair of medial brown spots, usually inconspicuous; tergite 5 with well defined anteromedial and lateroapical, rarely with pair of incon-

spicuous anterolateral spots. Female: tergites 4–6 with 1 medial pair of small black spots at anterior margin, usually entirely hidden underneath posterior margin of preceding tergite.

Male postabdomen: Epandrium as on fig. 4, *1*, surstylus with subequal, claw-like prensisetae (fig. 4, *2*); glans as on fig. 2, *1*, with basal (simple tubular) portion of acrophallus (ba) 1.4–1.6 times as long as sclerotized apico-dorsal rod (adr).

Female postabdomen. Oviscape (fig. 3, *7*, *8*) 2.0 mm long, as long as tergites 3–6 combined, aculeus 2.5 mm long.

Dimensions. WL♂ = 4.0–4.8 (4.5 in holotype), WL♀ = 3.8–4.8 mm.

Etymology. This species is named for Amnon Freidberg, the world renowned specialist in the taxonomy of fruit flies, who was one of the first collectors of this species and recognized it as a new taxon.

Host plant. This species was reared from flower heads of *Centaurea behen* L. in Iran. Another fruit fly associated with this host plant is *Urophora merzi* Mohamadzade Namin 2011.

Comments. The new species differs from other species of the group by its larger size and reddish or orange vittae on the mesonotum, as noted in the key above. Males can be differentiated from all other species except *T. ivannikovi* sp. n. by the structure of the phallus glans, and from the latter species by the characters given in the key. *T. freidbergi* sp. n. shares the reddish lyrate pattern on the mesonotum and size with *T. virpana* Dirlbek from Iran (Dirlbek, 1980), known only from the holotype female; the latter species differs by the abdomen black setulose and by the metatergite mostly reddish yellow (except shining black spot in the middle).

Terellia ivannikovi V. Korneyev et Evstigneev, **sp. n.** (fig. 1, *1*, *2*; 2, *2*; 5)

Material. **Type**. Holotype ♂: **Russia**: Samara Region: Pestrava District, saline steppe near Mayskoye (52°16' N, 50°02' E), ex flower heads of *Chartolepis intermedia* Boiss., 1.05.2000 — exit 12.06–2.09.2000 (Evstigneev) (SIZK). Paratypes: **Russia**: 1 ♂, 2 ♀, labels as in the holotype, 1.05.2000 — exit 12.06–2.09.2000; 2 ♀, idem, 17.08.2000 — exit 10–20.09.2000, 1 ♀, exit 23.07.2001, 5 ♂, 6 ♀, 14.08.2005 — exit 9.01–27.05.2006, 1 ♂, 1 ♀, idem, on *Ch. intermedia*, 12.07.2006, 1 ♂, idem, swept from *Ch. intermedia*, 16.07.2009 (Evstigneev); 1 ♂, Bolshechernigovskoe District, Verkhnie Skrypali near Verkhnie Rostashi, saline steppe, ex *Ch. intermedia*, 17.05.2007 — exit 27.05.2007; 1 ♂, 3 ♀, idem, ex *Ch. intermedia*, 6.06.2009 — exit 26.06–4.07.2009; 1 ♀: idem, swept from *Ch. intermedia* (Evstigneev) (ZISP; ZMUM; SIZK, CDE). **Kazakhstan**: vicinity of Zharyk railroad station [48°50' N, 72°50' E], N 74–266, sample 741, 6.10.1974, [reared ex flower heads of Asteraceae], exit 04.1975, 1 ♂ (Ivannikov); 1 ♀: same locality, 18.06.1975, N 128–75 (Ivannikov) (SIZK). **Examined specimens not included in the type series**: **Uzbekistan**: Fergana valley, Yazyavan Distr. h = 470 m, 1 ♂, 5 ♀ (Merz) (MHNG).

Description. Head (fig. 1, *1*). HR = 1 : 1.3 : 1.7, otherwise as described for *T.freidbergi*.

Thorax as described for *T. freidbergi*, except scutum in live specimens intensively greenish yellow, with black lyrate pattern and brown spots at bases of acrostichal seta (fig. 5, *2–3*). Scutellum slightly wider than long, with 8–15 white setulae on each margin. Pleura greenish yellow, katepisternum and meron with 2 black spots poorly visible through sparse whitish microtrichia. Metatergite black, whitish microtrichose, except shining spot at middle.

Legs uniformly yellow; brownish setose and setulose, except fore femur with 2 dorsal rows of white setae in basal 0.8 of its length.

Wing. Hyaline, with yellowish pterostigma and brownish veins in apical half.

Abdomen. In live specimens, tergites greenish yellow with posterior one-third purely yellow. Male: tergites 3 and 4 with pair of medial brown spots, usually inconspicuous; tergite 5 with well defined anteromedial and posterolateral, rarely with pair of inconspicuous anterolateral spots (as on fig. 1, *6*). Female: tergites 5–6 with 1–2 pairs of conspicuous black spots at anterior margin (as on fig. 1, *10*).

Male postabdomen. Epandrium as on fig. 5, *4*, with subequal claw-like prensisetae (fig. 5, *5*) as in *T. freidbergi*, glans of phallus with elongate tubular acrophallus apically

Fig. 5. *Terellia ivannikovi* sp. n.: *1* — holotype ♂, total right view; *2* — same, mesonotum, dorsal; *3* — paratype ♂, same (coloration of live specimen); *4* — epandrium; *5* — surstyli, enlarged; *6* — aculeus; *7* — aculeus apex; *8* — spermatheca (one of the two).

Рис. 5. *Terellia ivannikovi* sp. n.: *1* — голотип ♂, общий вид справа; *2* — то же, среднеспинка сверху; *3* — паратип ♂, среднеспинка сверху (окраска живого экземпляра); *4* — эпандрий; *5* — сурстили, увеличено; *6* — акулеус; *7* — вершина акулеуса; *8* — сперматека (1 из 2).

bifurcated into pair of short semitubular structures without corolla-like sclerites surrounding them; acrophallus basal part (ba) more than 3 times as long as sclerotized apico-dorsal rod (adr) (fig. 2, *2*).

Female postabdomen. Oviscape 1.7 mm long, as long as tergites 3–6 combined, aculeus apically rounded (fig. 5, *6*, *7*) 1.9–2.0 mm long. Two spermathecae with thin apical portion of spermathecal duct, as on fig 5, *8*.

Measurements. WL♂ = 4.0–4.5 (4.5 in holotype), WL♀ = 4.0–5.0 mm. AL = 1.9 mm.

Etymology. The new species is named for Alexandr I. Ivannikov (1948–1977), who started special studies of the fruit flies infesting asteraceous plants in Kazakhstan and Middle Asia and reared the very first specimens of this species.

Host plant. *Centaurea chartolepis* Greuter (syn. *Chartolepis intermedia* Boiss.). Other fruit fly species associated with this host plant are *Terellia amberboae* Korneyev et Merz, 1996 and *Urophora* sp. near *tenuis* (both reared from the host plant misidentified as *Amberboa* (Korneyev, unpublished data)).

Comments. This species is very similar to *T. freidbergi* from the Middle and Near East, differing only in black vittae and spots on mesonotum, longer acrophallus and different host plants; their distribution apparently does not strongly overlap.

T. freidbergi and *T. ivannikovi* share peculiar shape of the glans and apparently form a monophyletic sister lineage in the *virens* group with the *T. uncinata*, *T. virens* and *T. zerovae* lineage, which all share the acrophallus filaments wrapped in corolla-like sclerites.

Terellia uncinata White, 1989 (fig. 2, *4*)

White, 1989: 54 (key); Merz, 1993: 124; Hajighorbani et al., 2010: 139; Mohamadzade Namin et al., 2010: 36 (key); Kütük, Yaran, 2011: 515 (record from Turkey); Karimpour, 2011: 59; Mohamadzade, Nozari, 2011: 52; Hajighorbani et al., 2012: 27 (records from Iran). — Sobhian, Zwolfer, 1985: 312 (*Terellia* cf. *virens*). — *virens*: Neuenschwander, Freidberg, 1983: 87 (in part; misidentification) (*Terellia*).

Material. **Type**. Holotype ♂: **Italy**: Puglia, San Severo, ex *Centaurea solstitialis*, 17.07.1984 (exit 2–8.08.1984) (BMNH). **Paratypes examined**: 2 ♂, 1 ♀: **Italy**: Puglia, San Severo, ex *Centaurea nicaeensis*, exit 08.1984 (Clement) (BMNH). **Non-type**. **Greece**: "Griechenland 50856", 1 ♂ (ZMHB); Epiros, 10.6 km N Konitsa, ex *Centaurea solstitialis*, 12.09.1985 — exit 30.09.1986, 1 ♂ (Turner) (*T. uncinata* White, det. Norrbom 08.2001); Makedonia: 1 km. NE of Theotokos along Kosani-Ioanina rd., 91211, *Ce. solstitialis*, 12.09.1985 — exit 27.08.1986, 2 ♂, 2 ♀ (Turner) (*T. uncinata* White det. Norbom 1997); 20 km W Kosani, 9113, ex *Ce. solstitialis*, 11.09.1985 — exit 3.10.1986, 1 ♀ (Turner) (*T. uncinata* White, det. Norrbom 08.2001) (USNM). **Iran**: Urmia region, vicinity of Shпrъ Kandп village (Qasemlь valley), ex *Centaurea solstitialis* L., 9–18.05.2005, 3 ♂, 5 ♀(Karimpour) Arak, Bazeneh, 31.05.2008, 1 ♂, 1 ♀ (Hajighorbani); Ardabil, 15 km to Sarein, 1430 m, 38°10.601 N, 48°12.528 E, reared from flower heads of *Ce. solstitialis*, 10.09.2009 — exit: 17.09.2009, 5 ♂, 1 ♀ (Mohamadzade) (IAUV; SMNC). **Iraq**: "Kurdistan, open forest", Salahuddin, 8–9.07.1968, 3 ♂ (Starý) (MMBC). **Italy**: Rome: ex Centaurea solstitialis Acc#217A, 25.08.1963, 2 ♂ (Andres) (*T. uncinata* White, V. Korneyev det.) (SMNS), same labels, 1 ♂, 1 ♀ (Andres) (*T. uncinata* White, V. Korneyev det.); idem, "Onopordum Acc#469J", reared from head, 18.07.1963, 1 ♂, 1 ♀ (Frick) (USNM); S, Apulia, Spinazzila: *Ce. nicaeensis* resting on plant; 11.07.1966–7.08.1966, male phallus dissected, 1 ♂ (Zwölfer); idem, *Ce. solstitialis* resting on plant; 13.06.1966 — exit 7–15.07.1966, male phallus dissected, 1 ♂ (Zwölfer); Sicily, Enna, *Ce. solstitialis* Acc#272A, reared from head, 17.07.1961, 1 ♂; Sicily, Favara, Bivio, *Ce. solstitialis* Acc#349B, reared from head, 18.07.1961, 1 ♂ (Andres) (*T. uncinata* White, V. Korneyev det. 2008) (SMNS); Puglia, Tavoliere, 15 km NW Foggia, 700 m, 7.05.1990, 12 ♂, 12 ♀ (Merz and Müller) (MHNG). **Turkey**: 33 km. from Haymane twd. Yanice (site 28), ex *Ce. solstitialis* seedheads, 3 ♂, 2 ♀ (*T. uncinata* White, det. Norrbom 1997); Ankara, Yaglipinar Village, 3600', site 2–39, *Ce. solstitialis* L., 11.07.1995 — exit 26–28.07.1995, 3 ♂, 3 ♀ (Sobhian) (*T. uncinata* White, det. R. Takumi 1995); Balikeser, 1.5 km W of Balikesir 20.07.1984, ex *Ce. solstitialis* heads, 2 ♂, 2 ♀ (Rosenthal) (*T. uncinata* White, det. White, 1989); Burdur, jnctn. 20 rd. km N Bucac; site 2–8, *Ce. solstitialis*, 5.07.1995 — exit 28.09.1995 (Sobhian) (*T. uncinata* White, det. Takumi 1995); N of Burdur, RR tracks, ex *Ce. solstitialis* heads, 19.07.1984 — exit 31.07.1984, 5 ♂, 3 ♀; Jct. of Rds. to Antalya, Burdur, Isparta, ex *Ce. solstitialis* heads, 19.07.1984 — exit 3.08.1984, 2 ♀; Erzincan, 1 km E of Erzincan, ex *Ce. solstitialis* heads, 29.07.1984 — exit 7.06.1985, 1 ♂, 6 ♀; Icel, 0.5 km N of Nut, ex *Ce. solstitialis* heads, 16.07.1984 — exit 3.08.1984, 2 ♀; Icel, 46 km E of Silifke at Qulnar Jct. ex *Ce. solstitialis* heads, 16.07.1984 — exit 26.09.1984, 2 ♀; Isparta, 0.5 km E of Gelendost, ex *Ce. solstitialis* heads, 18.07.1984 — exit 27.09.1984, 7 ♂, 10 ♀ (Rosenthal) (*T. uncinata* White, det. I. M. White, 1989); Isparta, 8 km NE Gelendost, 3200', site 2–14, *Ce. solstitialis*, 7.07.1995 — exit 28.09.1995, 1 ♀ (Sobhian) (*T.* prob. *uncinata* White, det. Takumi 1995); Konya 0.8 km E of Seydesehir, ex *Ce. solstitialis* heads, 17.07.1984 — exit 27.09.1984, 3 ♂, 4 ♀ (Rosenthal) (*T. uncinata* White, det. White, 1989); Konya, 33 km S Seydisehir twd. Bozkir, 4000', site 2–18, *Ce. solstitialis* L., 8.06.1995 — exit 23–28.08.1995, 1 ♂, 1 ♀ (Sobhian) (*T. uncinata* White det. Takumi 1995; *T. uncinata* White, det. Norrbom 08.2001); Konya, 60 km E Gelendost, 4000', site 2–15, *Ce. solstitialis*, 7.07.1995 — exit 28.09.1995, 3 ♂, 1 ♀ (Sobhian) (*T. uncinata* White, det. Takumi, 1995); Sansun 18 km E of Nerziton, *Ce. solstitialis* heads, 25.07.1984 — exit 3.10.1984, 6 ♂, 7 ♀; Turgat W. of Toaget near Yoggat, Holding Co., *Ce.. solstitialis* heads, 31.07.1984 — exit 5.10.1984, 1 ♂, 2 ♀ (Rosenthal) (*T. uncinata* White, det. White, 1989) (USNM).

Comments. Study of the material from the USNM collection shows that this species is more widespread throughout Asia Minor than could be considered from Kütük, Yaran (2011), who gave only one locality of this species from Ankara. The material listed by them as "*T. virens*" might contain some specimens of *T. uncinata*. It occurs together with either *T. virens* or *T. zerovae* from Italy to Iran and Iraq and cannot be identified without studies of the phallus structure.

Terellia virens (Loew, 1846) (fig. 2, *3*; 6–7)

Loew, 1846: 523 (*Trypeta virens*); Hendel, 1927: 129; Korneyev, 1985: 630; White, 1989: 56; Merz, 1994: 92; Merz, Baez, 2002: 194; Korneyev S., 2008; Kütük, 2008: 279. — *syllibi* Rondani, 1870 (*Tripeta*) (synonymized by White, 1989).

Material. **Type**. Lectotype ♂: "2/8 44", "coll. H. Loew", "Typus", "Lectotype Trypeta virens Loew I. M. White des. 1987" (ZMHB); Paralectotype ♀: "2/8 44", "coll. H. Loew", "Typus", "Trypeta virens Loew I. M. White det. 1987" (ZMHB). **Non-type**. **Austria:** Eastern Austria, 26–30.08.1994, 2 ♂, 2 ♀ (Scheibelreiter); Eastern Austria, north of Wiener Neustadt, from *Centaurea maculosa* 29–30.08.1995, 8 ♂, 5 ♀ (Scheibelreiter) (*Terellia virens* (Loew) det. Norrbom 06.1995); Eastern Austria, ex *Ce. maculosa* seed heads, from sample released in Montana, 14.09.1991 — exit 06.1992, 1 ♂, 1 ♀ (Hing et Scheibelreiter) (*Terellia virens* (Loew) det. Norrbom 06.1992) (USNM); Burgenland Neusiedlersee, *Ce. stoebe* (*maculosa*), 30.04.1967 — exit 2.08.1967, 2 ♂, 1 ♀; Lower Iheresienfeld, *Ce. stoebe* (= *maculosa*), 2.09.1964 — exit 2.10.1964, 2 (Zwölfer) (ZSSM); Hainburg, 1.09.1990, 1 ♂ (Freidberg) (TAUI); **Czechia:** Praha-Bohnice, 1.5 km N, 50.08° N 14.21° E, 1 ♂ (Barták); 2 km N, 50.09° N 14.26° E, 1 ♂ M. Bartak (ZSSM); Praha-Stodůlki, ex *Ce. maculosa*, 2.07.1996, 2 ♀; Praha-Vypich, ex *Ce. maculosa*, 3.07.1996, 1 ♂ (Kinkorová) (SIZK); **France:** E., Ht. Rhin, Mulhouse, *Ce. stoebe*, 22.08.1973 (with puparium), 5 ♂, 3 ♀; 14.12.65 — exit 7, 25.07.1966, 2 ♂, 3 ♀, 14.12.1965 — exit 7.07.1966, 2 ♂, 2 ♀, 14.12.1965 — exit 7.07.1966, 2 ♂, 2 ♀; idem, ex *Ce. stoebe* (*maculosa*), 5.09.1964, 1 ♀ (Zwölfer) (ZSSM); Rhine Valley, *Ce. maculosa*, 11.1972, 5 ♂, 3 ♀ (Dunn) (*Terellia virens* Lw. d. G. Steyskal 1973) (USNM); S, Avignon, ex *Ce. paniculata* (= *stoebe*), 8.08.1964–25.05.1965, resting on plants, 2 ♀ (Zwölfer) (ZSSM); Die, 40 km E Valence, 12.09.1972, 1 ♂; Digne, 13.09.1972, 2 ♂, 1 ♀ (Freidberg) (TAUI); **Germany:** "Mödling", 30.08.1887, "Collection J. M. Aldrich", 1 ♂ ("*Trypeta virens* Lw.", "*Terellia virens* Lw. Kert.") (USNM); S, Neuenburg *Ce. stoebe*

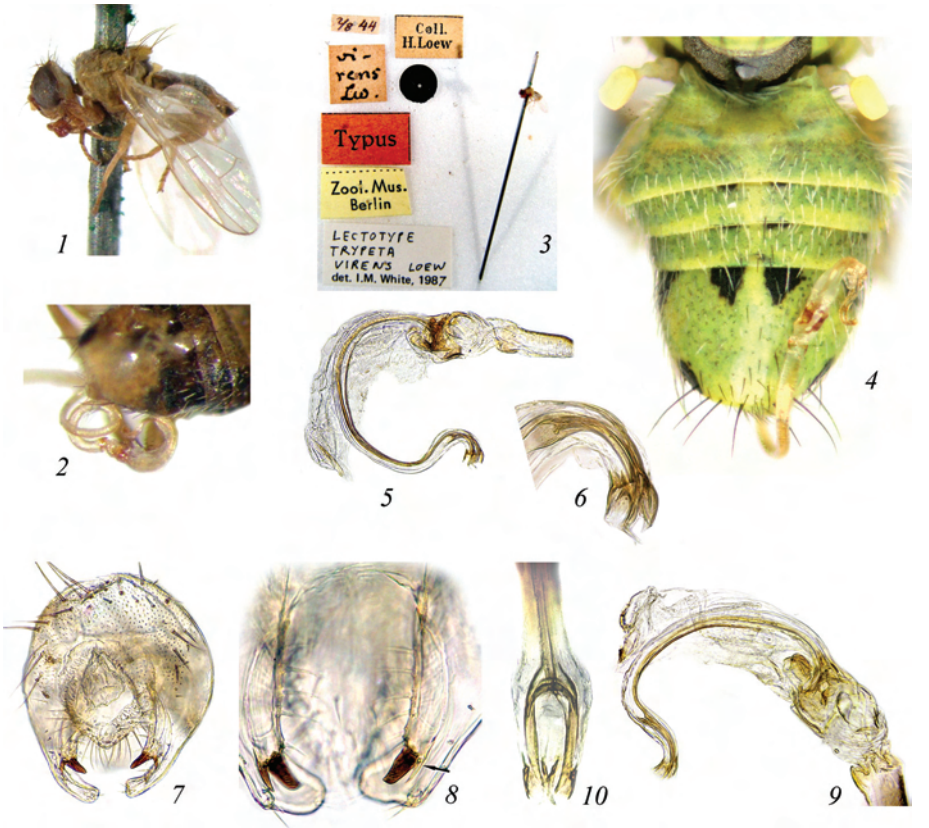

Fig. 6. *Terellia virens*, ♂ (*1–3* — lectotype; ZMHB; *4* — Ukraine; *5–8* — Sicily; *9–10* — Israel): *1* — total left view; *2* — abdomen dorsal; *3* — labels; *4* — abdomen dorsal; *5*, *9* — glans, left; *6* — same, apex of acrophallus, enlarged; *7* — epandrium; *8* — surstyli; *10* — apex of acrophallus, posterior view, enlarged.

Рис. 6. *Terellia virens*, ♂ (*1–3* — лектотип; ZMHB; *4* — Украина; *5–8* — Сицилия; *9–10* — Israel): *1* — общий вид слева; *2* — то же, брюшко сверху; *3* — то же, этикетки; *4* — брюшко сверху; *5*, *9* — гланс, слева; *6* — то же, вершина акрофалла, увеличено; *7* — эпандрий; *8* — сурстили; *10* — вершина акрофалла, вид сзади, увеличено.

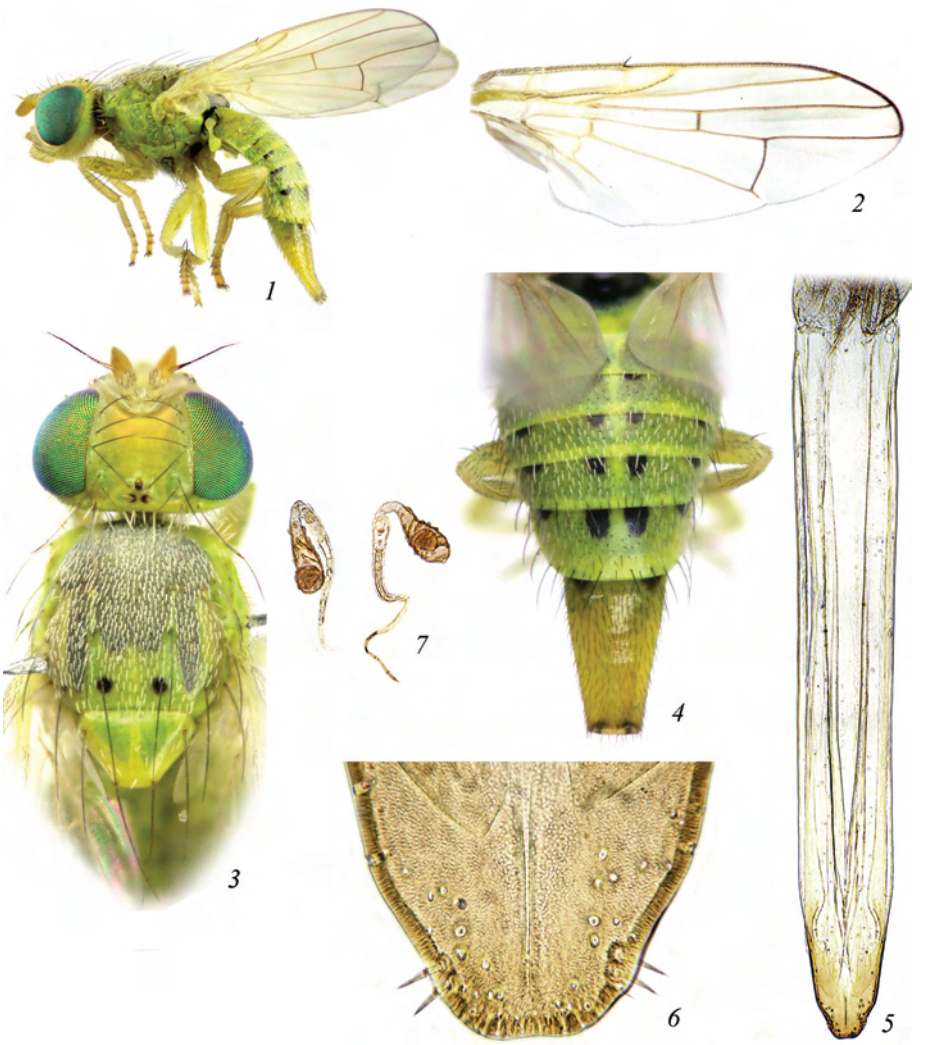

Fig. 7. *Terellia virens*, ♀ (Ukraine, non-type specimen): *1* — total left; *2* — wing; *3* — mesonotum, dorsal; *4* — abdomen dorsal; *5* — aculeus; *6* — apex, enlarged.

Рис. 7. *Terellia virens*, ♀ (Украина, внетиповой экземпляр): *1* — общий вид слева; *2* — крыло; *3* — среднеспинка, сверху; *4* — брюшко сверху; *5* — акулеус; *6* — вершина, увеличено.

(*maculosa*), 4–6.08.1965 — exit 14.09.1965, 2 ♂; SW, Upper Rhine Valley, Basle, *Ce. stoebe* (*maculosa*), 30.08.1963 — exit 25.11.1963, 1 ♀; SW, Upper Rhine Valley, Jstein, ex *Ce. stoebe* (*maculosa*) 17–19.06.1966, resting on plants, 2 ♀; idem, ex *Ce. stoebe* (*maculosa*) 20.08.1963 — exit 25.11.1963, 1 ♀; idem, Kleinkams, ex *Ce. stoebe* (*maculosa*) 4.08.1965 — exit 14.09.1965, 1 ♂, 3 ♀ (Zwölfer) (ZSSM); Berlin, "zu Juv. " 25.07, 1 ♂ (Spichs) (ZMHB); **Greece:** "Korfu, IV, 45479", 1 ♂; "Rhodus", "coll. H. Loew", 1 ♂ (Erber); [Rhodus] (small blue [= Griechische Inseln] and black [= Rhodus] square), "coll. H. Loew" (phallus dissected), 2 ♂ (Erber) (ZMHB); Sterea Elada, 8 km E of Karpenissi nr Agios Nikolaos, from seed head of *Ce. affinis* ssp. *pallidior*, 12.08.1986, 1 ♂, 1 ♀ (Sobhian) (*Terellia virens* (Loew) det. A. L. Norrbom 08.2001); Epiros nr. Metsovo, 13.09.1985, ex *Centaurea*, 1 ♂ (Turner); Makedonia 5 km up to Milia, 4800 ft on Ionina-Larissa rd., ex seed head of *Ce. lacerata* 28.08.1986, 1 ♂ (Sobhian) (*Terellia virens* (Loew) det. A. L. Norrbom 08.2001) (USNM); **Hungary:** "Budapest 46790", 1 ♂ (Trypeta virens Lw. [Becker det.]); "Ungarn 40861", 1 ♂ (Trypeta virens Lw. [Becker det.]) (ZMHB); Hungary N end Valencei-to (L. Valence), near monument, 2 ♂ (Norrbom) (*Terellia virens* Lw. V. Korneyev det. 2008) (USNM); Budapest 10 km NW, steppe forest, 110 m 47.33° N 18.59° E, 2 ♂, 1 ♀ (Barták) (ZSSM); "Ungarische Flugsandsteppe", 1 ♂ (Saly) (*Terellia virens* Lw. det. Becker) (SMNS); **Israel:** Gilgal, 1.03.1973, 2 ♂ (Freidberg) (*Terellia virens* Lw. det. A. Freidberg 1977) (USNM); "Haifa IV / 45479", 1 ♂ [Becker] (*Terellia virens* Lw. det. A. Freidberg 1977) (ZMHB); Mt. Hermon 2000 m, 6.08.1986, 1 ♂ (*Terellia virens* det. Freidberg 1989); idem, 6.08.1986, 1 ♂ (Mathis) (*Terellia virens* Lw. V. Korneyev det. 2008); W. Faria 1.03.1973, 4 ♂, 2 ♀ (Freidberg) (*Terellia*

virens Lw. det. A. Freidberg 1977) (USNM; TAUI); Tel Aviv, ex flower heads of *Ce. procurrens*, 2.08.1992 — exit 17.08.1997, 2 ♂ (1 dissected) (Freidberg) (TAUI); Bet Guvrin, ex *Ce. hyalolepis*, 25.10.1976 — exit 15.06.1977, 1 ♂ (dissected) (Freidberg); Alummot, 1.07.1997, 1 ♂ (dissected) (N. Dorchin); **Italy:** S, Calabria, Sybaris, *Ce. melitensis*, 15.06.1966 — 7, 15.07.1966, ex *Ce. melitensis*; male phallus dissected 2 ♂, 3 ♀ (Zwölfer) (*Terellia virens* V. Korneyev det. 2008) (ZSSM); Sicily, Erice, ex *Ce.* sp., 29.08.1982 — exit 04.1983, 3 ♂ (2 dissected), 1 ♀ (Freidberg) (TAUI; SIZK); **Iraq**: Kurdistan, open forest, 8.07.1968, 1 ♂ (dissected); idem, Salahuddin, 9.07.1968, 3 ♂ (Starý) (MMBC); **Moldova:** Chişinău, vicinity, airport, ex flower heads *Ce. biebersteini* (= *stoebe*), 7.08.1987 — exit 1.05.1988, 4 ♂, 3 ♀ (V. Korneyev) (*Terellia virens* Lw. V. Korneyev det.); Singera, swept from *Ce. diffusa*, 7.08.1987, 2 ♂; mouth of Reut near Dubossari, ex *Ce. micranthos* (= *stoebe*), 26.04.1986 — 1–7.06.1986, 2 ♂, 3 ♀; Olaneşti, ex *Ce. micranthos* (= *stoebe*), 2.05.1986 — 25.05–8.06.1986, 1 ♀ (V. Korneyev) (SIZK); **Morocco:** Tizi-n-Talrhemt pass, 1900 m, Zool. Mus. Cop. Exp., 1 ♂ (phallus exposed) (*Terellia virens* (Loew) det. B. Merz) (ZMUC); **Poland** "Breslau / Scholty", "coll. H. Loew" sex unknown, abdomen missing, "Type [red label, printed]" (non-type specimen, locality not mentioned in the original paper; obviously collected after description) (ZMHB); **Russia:** Ulyanovsk Region: Ulyanovsk District, Klyuchischi, sand steppe, ex flower heads of *Ce. pseudomaculosa*, 23.08.2000 — exit 5.04.2001; 3 ♂ (Evstigneev) (SIZK); Samara Region: Pestrava District, Mayskoe, saline steppe, 18–20.08.2000, ex *Ce. stoebe*, 3 ♂; Sadovka, shrubs, ex *Ce. trichocephala*, 15.07.2009 — exit 2010, 2 ♂; Elkhovka District, Elkhovka, chalk steppe, ex *Ce. stoebe*, 13.08.2004 — exit 21.12.2004–27.04.2005, 3 ♂, 2 ♀; Bolshechernigovskoe District, Verkhnie Skrypali near Verkhnie Rostashi, saline steppe, ex *Ce. trichocephala*, 17.07.2009 — exit 2010, 2 ♂, 2 ♀ (Evstigneev) (CDE); **Serbia:** Delibato Nat. Park E of Beograd, 22.08.1983, 9 ♂, 9 ♀ (1 ♂ with phallus exposed) (Zool. Mus. Copenh. Exped.) (*Terellia virens* Loew V. Korneyev det. 2008) (ZMUC); **Slovakia:** h = 50 m, Bratislava, 1 ♂ (Merz) (USNM); 10 km NW Hegy-Farok, 47.50° N 18.36° E, 3 ♂ (Barták) (*Terellia virens* det. Dirlbek) (ZSSM); **Switzerland:** Delemont, voucher specimen, ex capitulum *Ce. vallesiaca*, 7.08.1989 — exit 06.1990, 5 ♂, 1 ♀, 4.07.1985 — exit 15.07.1986, 3 ♂, 4.07.1985 — exit 10.07.1986, 1 ♂ (Marquardt) (USNM); Rhone Valley, Branɔon, *Ce. stoebe* (*maculosa*), 17.08.1965 — exit 30.10.1965, 2 ♂, 1 ♀, Rhone Valley, Brig, *Ce. maculosa*, 11.05.1970, 3 ♂, 3 ♀ (Zwölfer) (ZSSM); Swiss Valais: M94058, 18.08.1993, 2 ♂, 2 ♀ (Stegen et Groppe) (USNM); VS: Visperterminen, Kreuz (46°15'17" N 7°53'52" E), 1500 m, 21.07.2004, 3 ♂, 2 ♀ (Norrbom) (USNM); **Tunisia:** Aim Draham, 25 km SE, 10–16.05.1988, 1 ♂ (Zool. Mus. Cop. Exp.) (phallus exposed) (*Terellia virens* (Loew) det. A. Freidberg) (ZMUC); **Ukraine:** Crimea: Karadagh, 25.07.1984, 1 ♂, 22.08.1984, 2 ♂ (Karachevskaya); Donetsk Region: vic. Telmanove, Khomutovskiy Step Nature Reserve, ex flower heads of *Ce. diffusa*, 23.04.1975, 18.04.1978 — exit 05–06.1978, 12 ♂, 13 ♀ (Zerova) (SIZK); Kharkiv Region, Volchansk Distr., Bochkovo, ex *Ce. micranthos* (= *stoebe*), 29.04.1985 — exit 8.05–20.06.1985, 10 ♂, 11 ♀ (Berest) (SIZK); Kherson Region: Black Sea Nature Reserve, Ivano-Rybalchansky Cordon, ex *Ce. breviceps*, 23.04.1985 — exit 1.06.1985, 1 ♂, Solonoozerny Cordon, 20.05.1985, 1 ♂ (V. Korneyev); Kyiv Region: Kruglyk, 16.07 — exit 26.08.2006, 1 ♂, 1 ♀ (V. Korneyev) (SIZK); Trakhtemyriv, 30.06.1988, 1 ♂ (Zrazhevsky) (SIZK); Mykolaiv Region: Maryivka, 10.07.1976, 2 ♂, 4 ♀ (Berest); Myghiya, 48°00' N 30°58' E, 21.06.2009, 1 ♀; 48°00' N 30°58' E, 22.06.2009, 1 ♂, 2 ♀ (V. Korneyev); Lugansk Region: Novo-Aidar, ex *Ce.* sp., 28.10.1982 — exit 10.1982–01.1983, 9.09.1983 — exit 09.1983–01.1984, 30 ♂, 34 ♀ (B. Volkov) (SIZK); Trekhizbenka, 8.06.2009, 1 ♀; 19.06.2009, 1 ♀; 20.06.2009, 1 ♂ (Konovalov); 9.04.2011, 1 ♂, 1 ♀; Uspenka, ex *Ce. stoebe*, 8.10.2010 — exit 27–29.03.2011, 15 ♂, 6 ♀; same, exit 9.04.2011, 12 ♂, 4 ♀; Ivanovka, ex *Ce. stoebe*, 8.10.2010 — exit 8–9.04.2011, 12 ♂, 5 ♀; idem, ex flower heads of *Ce. jacea*, 8.10.2010 — exit 8–9.04.2011, 2 ♂; Provallya, ex *Ce. diffusa*, 4.10.2010 — exit 8–9.04.2011, 3 ♂, 2 ♀ (S. and V. Korneyev); Odessa Region: Tylihul Lagoon, 47°02' N 30°58' E, 23.07.2009, 2 ♂ (S. and V. Korneyev); **USA:** Montana: Galatin Co. Rozeman, 31.07.2000, 1 ♂, 1 ♀ (Lang) (*Terellia virens* Lw. V. Korneyev det. 2008) (USNM). **Dubious collection identifications**: **Italy**: Sicily, Mandra, 221, reared from head *Ce. caerulescens* Acc#157G, 19.07.1960, 1 ♀ (Andres) (*Terellia* sp. nr. *virens* Lw. d. H. Zwoelfer d. R. H. Foote 1968) (USNM); **Russia:** "Sarepta, 30325" (head missing) 1 ♀; " Sarepta, 36813", sex unknown, abdomen missing (ZMHB); Stavropol Kray: Svetlograd, Kutsai Mt., 8.08.1988, 3 ♀ (V. Korneyev) (SIZK).

Redescription. Head (fig. 7, *1*, *3*) yellow, as described for group of species.

Thorax (fig. 7, *3*). Greenish yellow, mesonotum. katepisternum and meron with black, rarely brown pattern; mediotergite black. Dorsocentral seta without black spot, acrostichal seta with shining black spot at its base. All setae dark yellow.

Legs yellow, fore femur with two dorsal rows of brown setae and ventral row of dark yellow setae.

Wing (fig. 7, *2*) hyaline, with yellow pterostigma and veins in basal two-thirds and brown veins in apical one-third, but no grey shadows in the disk. Vein R_{4+5} with 0–2 setulae at base.

Abdomen (fig. 6, *4*; 7, *4*) greenish yellow, in dry specimens usually brownish yellow (fig. 6, *1*, *2*); tergites 1–4 almost entirely whitish setulose, tergites 5 (–6) with black setulae posteromedially; black marginal at sides on tergite 4 and along whole margin of

tergites 5 (−6). Tergites 3−5 (−6) with 2 pairs of basal black spots, spots of lateral pair on tergites 3−4 often reduced or absent (fig. 1, *5*, *9*; 6, *4*).

Male postabdomen as described for the group of species, surstylus with lateral prensiseta conspicuously thinner than medial one, rarely replaced with common setula (fig. 6, *8*, arrow). Phallus glans as on fig. 2, *3*; 7, *5−6*, *9−10*; with long acrophallus, apically bifurcated into moderately short paired tubular processes (philaments) (fig. 6, *10*) covered by small corolla-like sclerites half as long as sclerotized apico-dorsal rod (fig. 2, 3).

Female postabdomen. Oviscape yellow, with 2 black basal spots on dorsal side, black setulose, as long as tergites 4−6 combined (fig. 7, *4*). Aculeus widely rounded

Measurements. WL♂ = 2.2−3.7 (3.3 in holotype), WL♀ = 2.4−4.2 mm. AL = 1.3−1.6 mm.

Host plants. *Centaurea stoebe* L. (also under its synonyms or misidentifications, *biebersteinii*, *maculosa*, *micranthos*, *paniculata*, *pseudomaculosa*), *Ce. arenaria* Bieb. ex Willd. and *Ce. diffusa* Lam. throughout Europe and in North America; reared also from *Ce. vallesiaca* (DC.) Jordan, *Ce. breviceps* Iljin (in Ukraine), *Ce. hyalolepis* Boiss. and *Ce. procurrens* Sieber ex Spreng. (Israel), *Ce. pallescens* Del. and *Ce. iberica* Trevir ex Spreng. (Israel; Jordan) and *Ce. melitensis* L. (Italy); *Ce. aspera* in France and Spain (White, 1989; Clavel, 2012). White (1989) lists most of them and notes also single rearing records from *Ce. pectinata* L. in France and *Ce. nigrescens* Willd. in Germany; in addition, it is recorded to develop in flower heads of *Ce. jacea* L. in Eastern Ukraine and from *Ce. trichocephala* D.C. in Russia.

Comments. *T. virens* is a common species in Southern Europe, where its common host plants, *Ce. stoebe* and *Ce. diffusa* occur; however, it is apparently absent in Belgium, the Netherlands, and Great Britain, where the climate is mild, preferring dryer and more continental areas with better insolation though more severe summers and winters. In general, its northern boundary coincides by the Wood-and-Steppe zone in East Europe (Ukraine, Moldova, and European Russia). No specimens of *T. virens* from Asia Minor, Transcaucasia or Middle East were found in this study by the first author. Material and localities listed by Kütük (2008) from Turkey need thorough re-examination as it was identified without use of genitalic characters and might contain at least some misidentified specimens, judging from the list of host plants, which includes "*Centaurea iberica* Trev. ex Spreng, *C. hyalolepis* L., *C. vallesiaca* L., *C. calcitropa* L., *C. solstitialis* L., *C. maculosa* Lam., *C. alba* L., and *C. pichleri* L." (Kütük, 2008: 239; Kütük, Yaran, 2011: 515), most of which can be also the host plants of either *T. uncinata* or *T. zerovae*. However, numerous Israeli flies identified as *T. virens* are associated with *Ce. iberica* (Freidberg, Kugler, 1989) and *Ce. hyalolepis* (see records above) in this region, either forming an isolated population associated with starthistles known as common hosts for *T. zerovae* and *T. uncinata*. The distribution of these three species overlap in the eastern part of the Mediterranean region, but their distribution and host plants from Balkans to Caucasus deserve detailed mapping.

Wing length and body size may vary depending on the host plant of larvae (slightly smaller on *Ce. diffusa* than on *Ce. stoebe*). Shape of inner processes of the corolla-like sclerites of the phallus glans seem to vary very slightly between specimens from Ukraine, Sicily and Israel, but otherwise show no reliable morphological differences.

Terellia whitei V. Korneyev et Mohamadzade, **sp. n.** (fig. 2, *8*; 8)

Material. **Type**. Holotype ♂: **Turkmenistan:** Kuhitang mts. [= Koytendag], Kainar-Baba Mt., 2600 m, ex flower heads of *Cousinia* (?) *leptoclada* Kult., 20.05.1992 — exit 26.05.1992 (phallus exposed) (V. Korneyev) (SIZK). Paratypes: **Iran**: 1 ♂, 2 ♀, West Azerbaijan Province, Ziveh, 10 km W Ziveh, 37°08' N, 44°52' E, 2630 m, 25.08.2011 and idem, from flower heads of *Cousinia* sp., 24.07.2011 — exit 30.07.2011; 3 ♀, Khorasan Razavi Province, Binalood, 10 km NW Dizbad, 36°06.6' N, 59°14.9' E, 2150 m, 25.08.2011, from flower heads of *Cousinia* sp., 15.07.2011, date of exit: 12.08.2011 (Mohamadzade) (IAUV; SMNC); **Kazakhstan**: 4 ♂, 5 ♀: Bigas 20 km N Lugovaja, ex flower heads *Cousinia mollis*, 1.05.1994, exit

8–31.05.1994 (Merz) (MHNG); same locality: Moynkum desert, 20 km N Lugovaja, ex flower heads *Co. mollis*, 1.05.1994, exit 13–15.05.1994, 1 ♂, 1 ♀ (V. Korneyev); 3 ♂, 3 ♀, Moynkum Desert, Karay Plateau, ex plant encoded as "5–77", 7.06.1977 (Ivannikov); 3 ♂, lower flow of Ili River, N2142, [ex flower heads] exit 19–21.05.1977, 2 ♀, idem, exit 4–21.05.1977; 3 ♂ (1 dissected), Kolshengel / Uch-Zharma [c. 44°19' N 75°32' E], 53–77, N 2079, 20.04.1977 — exit 7.05.1977 (Ivannikov) (SIZK); **Kyrgyzstan**: 1 ♂, 1 ♀: Kyrghyz Alatau Mts 35 km ESE Dzhambyl [now Taraz], Kara Artsha River, 1250 m, ex flower heads of *Cousinia* sp. cf. *polycephala*, 4.05.1994, exit 13–25.05.1994 (Merz) (MHNG); 1 ♂: Tash-Kömür [= Tash-Kumyr], 11 km N, h = 900 m, 22.05.1994 (Merz) (MHNG); **Turkmenistan**: 1 ♂, 2 ♀, labels as in holotype, 20.05.1992 — exit 26.05, 2.06.1992 (V. Korneyev) (SIZK); **Examined specimens not included in the type series**. — **Iran**: S: Mian Jangal (loc. nr. 223), 30.05–5.06.1973, 1 ♂ (2nd Czechoslovak-Iranian Entomological Expedition) (NMPC). **Iran**: 6 km SSE Shut, 2190 m (loc. nr. 248), 17–18.06.1973, 1 ♀ (2nd

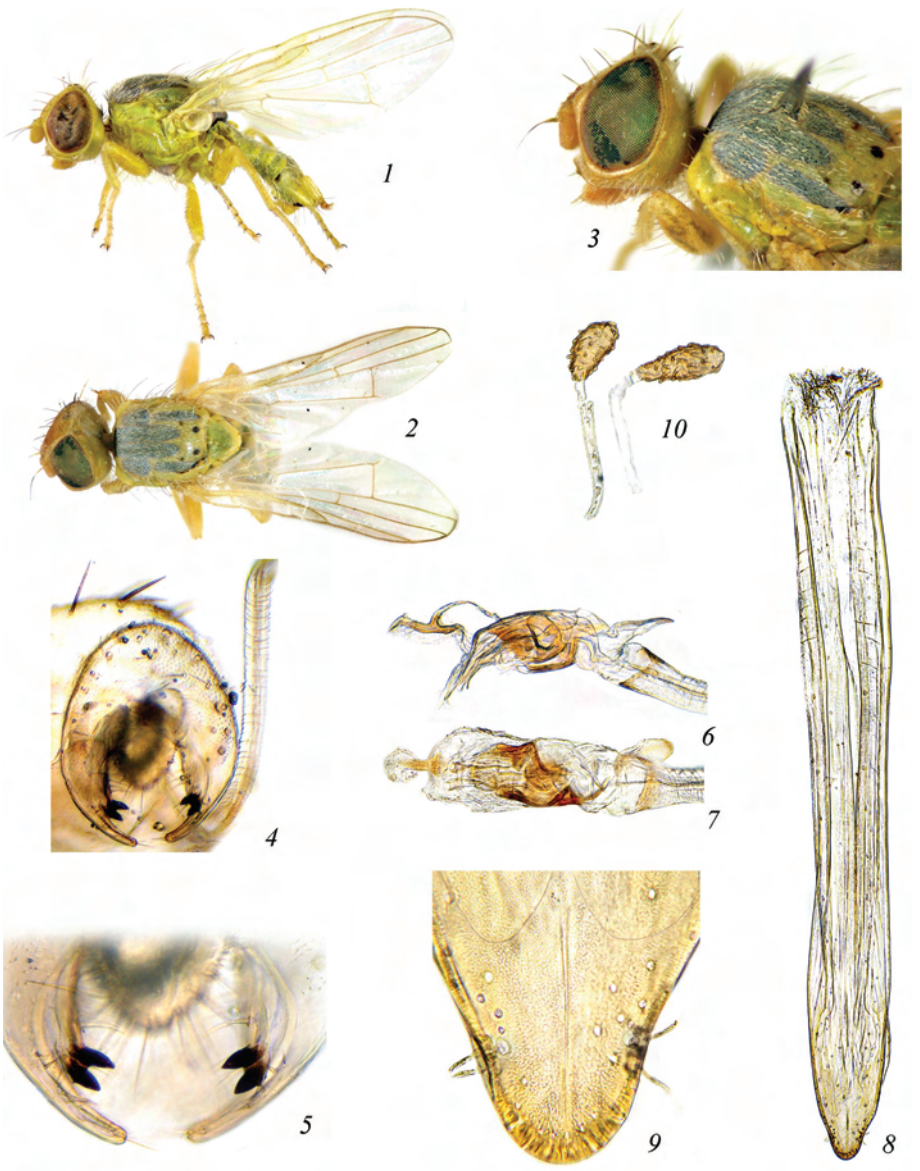

Fig. 8. *Terellia whitei* sp. n. (*1* — holotype ♂, *2–7* — paratype ♂, *8–10* — paratype ♀): *1* — total left view; *2* — same, dorsal; *3* — head, left and part of thorax; *4* — epandrium; *5* — surstyli, enlarged; *6–7* — glans (*6* — right, *7* — ventral); *8* — aculeus; *9* — apex, enlarged; *10* — spermathecae.

Рис. 8. *Terellia whitei* sp. n. (*1–3* — голотип ♂, *4–7* — паратип ♂, *8–10* — паратип ♀): *1* — общий вид слева; *2* — то же, брюшко сверху; *3* — то же, этикетки; *4* — эпандрий; *5* — сурстили, увеличено; *6–7* — гланс (*6* — справа, *7* — снизу); *8* — акулеус; *9* — вершина, увеличено; *10* — сперматеки.

Czechoslovak-Iranian Entomological Expedition) (NMPC); West Azerbaijan Province, Ziveh, 10 km W Ziveh, 37°08' N, 44°52' E, 2630 m, 25.08.2011, from flower heads of *Cousinia* sp., 24.07.2011 — exit 30.07.2011, 1 ♂, 1 ♀ (heads missing) (Mohamadzade).

Description. Head (fig. 8, *3*) as in *T. virens*.

Thorax (fig. 8, *1*, *3*) greenish-yellow as described for *T. virens*; mesonotum with black lyrate pattern, base of dorsocentral seta without dark spot, acrostichal seta with shining black spot at base. All setae dark yellow.

Legs as in *T. virens*, but fore femur with dark yellow setae dorsally.

Abdomen as in *T. virens*, except tergites 3 and 4 in examined specimens without lateral dark spots; tergite 5 of male podsteroventrally, and tergites 5–6 of female only with white setulae; tergite 5 of male and 6 of female with dark brown marginal setae.

Male postabdomen (fig. 8, *4–7*). Epandrium oval, with moderately narrow and elongate anteroventral lobe of surstylus; prensisetae acute, subequal (fig. 8, *5*). Glans of phallus (fig. 8, *6*, *7*) with short tubular part of acrophallus (as long as apicodorsal rod), and paired tubular processes (filaments) of acrophallus simple, without corolla-like structures.

Female postabdomen. Oviscape entirely yellow and black setulose, in examined specimens without dark anterobasal spots, as long or longer than tergites 3–6 combined. Aculeus as described for *T. virens*.

Measurements. WL♂ = 2.9–3.6 (3.6 in holotype), WL♀ = 3.0–3.6 mm. AL = 1.6–1.7 mm.

Etymology. This species is named for Ian M. White, a top expert in the taxonomy of fruit flies, who revised the *virens* group and described *T. uncinata* that belongs here.

Host plants. Larvae of *T. whitei* live in flower heads of various species (mainly unidentified) of the large genus *Cousinia* widespread mainly in the Middle East. Other fruit fly species associated with these hosts, are various species of the genus *Urophora* and some undescribed species of *Tephritis*.

Terellia zerovae V. Korneyev, 1985 (fig. 2, *5*)

Korneyev, 1985: 637; White, 1989: 59 (records from Romania, Greece and Turkey); Kütük, 2008: 239; Kütük, Yaran, 2011: 515 (records from Turkey); Mohamadzade Namin et al., 2010: 36; Mohamadzade Namin, Nozari, 2011: 52; Hajighorbani et al., 2012: 27 (records from Iran).
Terellia virens: Richter, 1965: 145 (misidentification); Dirlbek, Dirlbeková, 1974 (partly: record from Iran).

Material. **Type**. Holotype ♂: **Tadjikistan**: «Таджикистан, Душанбе / из *Centaurea iberica* 20.03.1981 — осень 1981 / М. Зерова» [Dushanbe, exit autumn 1981 (M. Zerova)], "Holotype / Terellia / zerovae / V. Korneyev" [red paper handwritten label] (ZISP). Paratypes: **Tadjikistan**: 2 ♂, labels as in holotype (SIZK); 2 ♂, 1 ♀: Dushanbe, ex *Ce. iberica*, 20.03.1981 — exit 8.05.1981 (Zerova and Diakontshuk) (SIZK). **Non-type**. **Afghanistan**: Bala Murghab, 6.07.1964, 1 ♂ (Jakeš) (MMBC); **Armenia**: Ashtarak [40°17' N, 44°21' E], 1.06.1960, 1 ♂ (Antonova) (ZMUM); Dzhrvezh [40°12' N, 44°35' E], 8.08.1959, 1 ♂, 1 ♀ (Zaitzev) (ZISP); **Azerbaijan**: Talysh Mountains, Kosmolyan [38°40' N, 48°22' E], 1.06.1959, 2 ♀ (Richter) (ZISP); **Greece**: Crete, Therisso Gorge, ex flower heads of *Ce. argentea*, 2.05.1985 — exit 13.05.1985, 1 ♂ (I. M. et F. J. White) (BMNH). **Iran**: Urmia, ex flower heads of *Ce. calcitrapa*, coll. autumn 2008 — exit 22.04–9.05.2009, 3 ♂, 3 ♀ (Karimpour) (SIZK); Arak, Anbarteh, 31.05.2009, 2 ♂, 1 ♀ (Hajighorbani); Namin, 1400 m, 38°24.892' N, 48°28.065' E, from flower heads of *Ce. aucheri*, 10.09.2009 — exit 14.09.2009, 3 ♂, 1 ♀ (Mohamadzade) (IAUV; SMNC); **Kazakhstan**: Chu River flood plain near Blagoveshchenskoe [= Blagoveshchenka: 43°17' N, 74°11' E], 23.04.1976, 10 ♂, 6 ♀ [reared, but host plant indicated only as a code: "23–76"] (Ivannikov) (SIZK); Taraz Region: 3 ♂, 2 ♀: "Dzhambul" [= Taraz], ex flower heads of *Ce. iberica*, 5.05.1994 — exit 05–06.1994 (Merz) (MHNG; SIZK); Shymkent Region: Kara-Tau Range, 15 km N Atabay, h = 550–800 m, sweeping, 8.05.1994, 2 ♂; same locality, [ex flower heads of *Ce. iberica*] 8.05.1994 — exit 8–31.05.1994, 6 ♂; same locality, h = 550–700 m, 9.05.1994, 6 ♂, 2 ♀; Kara-Tau Range, 15 km N Atabay, h = 550–900 m, 10.05.1994, 1 ♂ (Merz) (MHNG); "Kuyuk, Kara-Tau" [41°58' N 69°29' E], 19.07.1976 [reared, but host plant indicated only as a code: "214–76"], 1 ♂, 1 ♀ (Ivannikov) (SIZK); Tamerlanovka [42°36' N, 69°15' E] h = 350 m, 14.05.1994, 1 ♀ (Merz) (MHNG); Saryagach [41°27' N, 69°10' E] (10 km N of Tashkent) 14–15.05.1994, 8 ♂, 3 ♀ (Merz) (MHNG); Alma-Ata Region, vic. Almaty, Bolshaya Almaatinka River, 4.08.1928, 8 ♂, 4 ♀ (Shnitnikov); **Kyrgyzstan**: Bishkek: airport, ex flower heads of *Ce. squarrosa*, 31.07.1986 — exit 21.06–20.08.1987, 4 ♂, 2 ♀ (Korneyev) (SIZK); Lebedinovka [42°53' N 74°42' E, h = 742 m], ex flower heads of *Ce. iberica*, 30.07.1986 — exit 15–30.08.1986 and 26.03–22.06.1987, 10 ♂, 5 ♀; same locality, swept from *Ce. iberica*, 31.07.1986, 2 ♂, 2 ♀ (Korneyev)

(SIZK); Kyrghyz Alatau Mts 35km ESE Dzhambyl [now Taraz], Kara-Artsha River, 1250 m, ex flower heads of *Ce. iberica*, 4.05.1994, exit 05–06.1994, 10 ♂ (Merz) (MHNG); Talas valley, 10.3 km SW of Këk-Sai, steppe at northern foot of Manas Mountain, 42°26.5' N, 71°00.0' h = 1700–1850 m, 1 ♂ (Korneyev) (SIZK); "Tash-Kumyr" [Tash-Kömür], 11 km N, h = 900 m, 22.05.1994, 1 ♂ (Merz) (MHNG); **Tadjikistan**: Ramit Nature Reserve 50 km NEE of Dushanbe, 38°45' N, 69°20' E, 6–8.08.1985, 1 ♀ (M. Nesterov) (SIZK); Dushanbe, 23.06.1935, 1 ♂, 2 ♀; Ghissar, 2.07.1935, 1 ♀ (Gussakovsky) (ZISP); **Turkey**: 10 km E Erzurum, ex *Ce. calcitrapa*, 29.07.1985 — exit 25.09.1984–29.11.1985, 7 ♂, 1 ♀ (Rosenthal) (USNM); Trapezunt, östl. Strand, 11.06.1926, 13 ♂, 2 ♀, südl. von Samsun und Brachfand, 28.06.1926, 1 ♂, 1 ♀; Strand westl. von Samsun, 30.06–2.07.1926, 28 ♂, 37 ♀ Souk Su, bei Trapezunt, 3.07.1926, 4 ♂, 2 ♀ (Bischoff) (ZMHB); **Turkmenistan**: Kara-Kala [= Garrygala] Ravine [[38°17' N, 56°21' E], 12.07.1972, 1 ♂ (Nartshuk) (ZISP); 10 km S of Ashgabat, 17.04.1988, 2 ♀ (Antropov); Badkhyz: Eroylanduz Lake [35°40' N, 62°00' E], 23.05.1991, 1 ♂ (Ozerov); Kushka [35°17' N, 62°24' E], 20.05.1991, 2 ♂, 2 ♀ (Shatalkin) (ZMUM); Kerki, Garagum desert, 13.03.1990 (collector's name unreadable) 1 ♂ (ZISP); Kugitang [Köheteng] Mountains [37°56' N, 66°31' E], 18.05.1992, 1 ♀ (V. Korneyev) (SIZK); **Uzbekistan**: Tashkent, 12.06.1929, 2 ♂ (Rohdendorf) (ZMUM); "Buchara s.-o. l. Kumak" [39°59' N, 66°06' E], 15.07.1929, 2 ♂, 1 ♀ (Slavinskij) (ZMUM); "Prov. Maracandica" [Samarkand Province; no further label data], 1 ♀ (ZMUM).

Redescription. Head and thorax as described for *T. virens*, except dark spot at base of acrostichal seta usually pale brown and small rather than large and black.

Wing hyaline. As described for *T. virens*.

Abdomen greenish or brownish yellow; tergites 1–4 almost entirely whitish setulose, tergites 5 (–6) with black setulae posteromedially; brown marginal setae on tergites 5 (–6). Tergites 5 (–6) with 2 pairs of basal black spots, spots of lateral pair on tergites 3–4 in examined specimens reduced or absent; tergite 5 of male with pair of posterolateral spots (fig. 1, *5*, *9*).

Male postabdomen as described for *T. virens*. Phallus glans as on fig. 2, *5*; with moderately long acrophallus: its basal part (ba) less than twice as long as sclerotized apicodorsal rod (adr); paired corolla-like sclerites (fig. 2, 3).

Female postabdomen. Oviscape yellow, with 2 black basal spots on dorsal side, black setulose, as long as tergites 4–6 combined (fig. 7, *4*). Aculeus widely rounded.

Measurements. WL♂ = 2.6–3.7 (3.1 in holotype), WL♀ = 2.7–3.7 mm. AL = 1.3–1.6 mm.

Host plants. Larvae live in flower heads of *Centaurea calcitrapa* L., *Ce. iberica* Trevir. ex Spreng. and *Ce. squarrosa* Willd. Other flies associated with these host plants are *Chaetorellia conjuncta* Becker and *Urophora quadrifasciata sjumorum* Rohdendorf.

Comments. This species is associated with the purple starthistles, which are both weeds and sometimes edible plants in the Middle East, from South Eastern Kazakhstan and Kyrghyzstran, Afghanistan to Greece and Romania (White, 1989) in the West; so far, it has not been recorded from Israel, where its common host plant, *Ce. iberica*, is infested by *T. virens*.

Species of the genus *Terellia* similar to but not included in the *virens* group

Terellia odontolophi V. Korneyev, 1993 (fig. 1, *3*, *7*; 2, *6*; 9)

Korneyev, 1993: 67; Vasil'kovskaya, Korneyev, 2005: 70.

Material. **Type**. Holotype ♂ and paratypes: 49 ♂, 47 ♀: **Ukraine**: Odessa Region: right bank of Tilihul lagoon, 18 km S of Berezivka [47°2.399' N 30°58.481' E], larvae in flower heads of *Odontolophus trinervius*, 16–19.08.1991 — exit 31.12.1991–10.01.1992 (V. Korneyev) (SIZK, ZMUM, USNM, BMNH).

Redescription. Yellow to yellow-brown (bluish-gray in live specimens) flies.

Male. Head yellow, ratio length: height: width 1 : 1.1 : 1.5. Middle of frons bare, orbital plates with white setulae; setae (except postoculars) brown to light brown, peristomal setulae black, the rest of the hairs are white.

Thorax. Mesonotal scutum with black lyrate pattern, posterior margin of medial vittae posteriorly reaching level of dorsocentral setae; dark vittae obscured with dense and rather long white microtrichia; base of acrostichal seta without black spots, and it is usu-

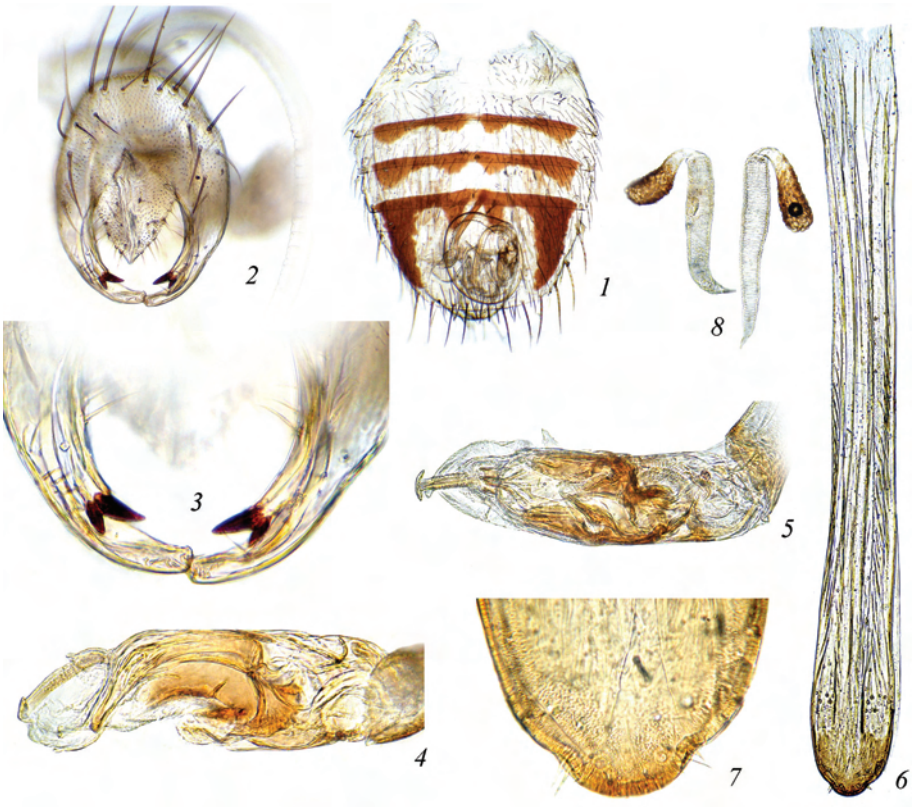

Fig. 9. *Terellia odontolophi* (*1–5* — ♂, *6–8* — ♀): *1* — abdomen macerated; *2* — epandrium; *3* — surstyli, enlarged; *4–5* — glans (*4* — right, *5* — ventral); *6* — aculeus; *7* — apex, enlarged; *8* — spermathecae.

Рис. 9. *Terellia odontolophi* (*1–5* — ♂, *6–8* — ♀): *1* — брюшко, мацерировано; *2* — эпандрий; *3* — сурстили, увеличено; *4–5* — гланс (*4* — справа, *5* — снизу); *6* — акулеус; *7* — вершина, увеличено; *8* — сперматеки.

ally brownish or yellow. Scutellum yellow, with no spots at base, with 20–25 whitish setulae along its margin.

Mediatergite black, laterally microtrichose, shining in the middle. Pleura without longitudinal bands, only katepisternum and meron with black microtrichose spots. Legs entirely yellow.

Wing hyaline; CuP cell not extending beyond cell bm apex.

Abdomen entirely white setulose with black pattern, as in fig. 1, *3*, *7*; 9, *1*; male tergite 5 with pair of long triangular lateral black spots reaching its posterior margin; marginal setae white, except on tergite 5 dark brown; female abdomen with 2 pairs of large, partially fused black spots on tergites 3–6 (fig. 1, *7*).

Male terminalia. Epandrium as on fig. 9, *2*, *3*, with lateral prensiseta smaller than medial; glans as on fig. 9, *4*, *5*: basal part of acrophallus and its paired tubular projections elongate, as long as apicodorsal rod.

Female terminalia. Oviscape yellow, slightly longer than tergites 4–6 combined; aculeus with ventral lobes almost reaching apex of its blunt rounded apex; apex of oviscape strongly transverse: distance between lateral setae 3.5–4 times as long as distance between level of basal lateral seta and aculeus apex (fig. 9, *7*). Spermatheca with long dilated neck (fig. 9, *8*).

Measurements. WL♂♀ = 3.0–4.0 mm. AL = 1.2 mm.

Discussion. This species strongly resembles species of the *virens* group, but shows no unambiguous synapomorphies with them, except the hyaline wing and short lobe of

cell bcu, and the rounded aculeus apex, which are highly subject to homoplasy in this tribe. It shares the structure of phallus glans and dilated apical portion of the spermathecal duct with the species of the *tarbinskiorum* group of species (Mohamadzade et al., 2011) and the genus *Orellia*, but the polarities of these characters are poorly understood. We do not place this species to any of the known groups until proper phylogenetic analysis is done. Here, we include it in the key and redescribe to avoid it being confused with species of the *virens* group.

The first author was unable to find this species even in its type locality 18 years after, likely due to overgrazing of grasses by cattle there. It is believed to be more widespread in the zone of steppe, but so far remains known only from its type series.

Terellia orheana V. Korneyev, 1990 (fig. 1, *4*, *8*; 2, *7*; 10)

Korneyev, 1990: 67; Vasilkovskaja, Korneyev, 2005: 102; Korneyev, 2006: 362; Evstigneev, Korneyev, 2006: 256 (record from Russia).

Material. **Type:** Holotype ♂: **Moldova:** Orghei, Trebujeni, limestone denudation in Reut Canyon, ex flower heads of *Jurinea stoechadifolia*, 6.07.1988 — exit 13–15.07.1988 (V. Korneyev); paratypes 2 ♂, 6 ♀: idem, ex flower heads of *J. stoechadifolia*, 6.07.1988 — exit 13–15.07.1988 and 26.07.1988 — exit 13–15.08.1988 (V Korneyev). **Non-type**. **Ukraine**: Odessa Region: Tylihul Lagoon, 47°02' N 30°58' E, ex flower heads of *J. stoechadifolia*, 19.08.1991 — exit 03.1992, 1 ♂, 2 ♀ (V. Korneyev), idem, 23.07.2009, 12 ♂, 4 ♀ (S. and V. Korneyev); Luhansk Region: Uspenka, ex flower heads of *J. stoechadifolia*, 8.10.2010 — exit 29.03.2011,

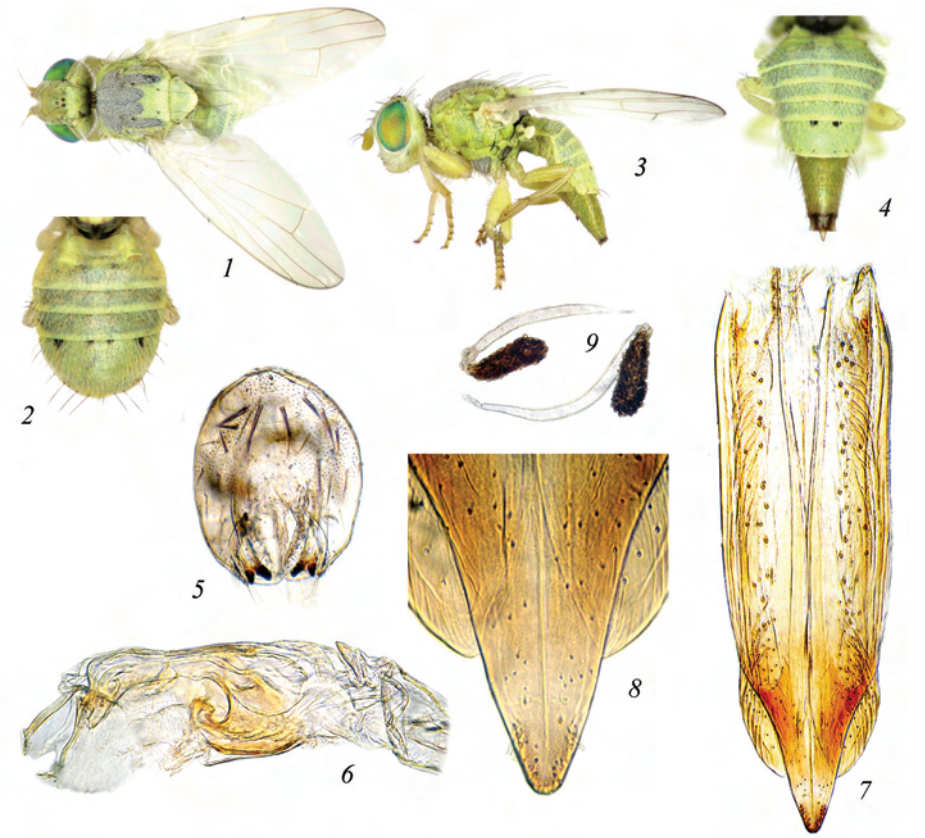

Fig. 10. *Terellia orheana* (*1–5* — ♂, *3–4*, *7–9* — ♀; *1–4* — coloration of live specimens): *1* — total dorsal; *2*, *4* — abdomen, dorsal; *3* — total, left; *5* — epandrium; *6* — glans, right, *7* — aculeus; *8* — apex, enlarged; *9* — spermathecae.

Рис. 10. *Terellia orheana* (*1–5* — ♂, *3–4*, *7–9* — ♀; *1–4* — окраска живых экземпляров): *1* — общий вид, сверху; *2*, *4* — брюшко, сверху; *3* — сурстили, увеличено; *5* — эпандрий; *6* — гланс, справа; *7* — акулеус; *8* — вершина, увеличено; *9* — сперматеки.

1 ♂ (V. Korneyev); **Russia**: (Samara Region), Pestravka Distr., saline steppe near Mayskoye (50°16' N, 52°02' E) ex flower heads of *Jurinea multiflora*, 2.07.2001 — exit 04.2002, 3 ♂, 6 ♀ (Evstigneev); Ulyanovsk Region: Radishevo Distr., Vyazovka (52°55' N, 48°24' E), ex *J. multiflora*, 18.08.2001 — exit 24.11.2001–25.03.2002, 2 ♂, 2 ♀ (Evstigneev) (CDE; SIZK); **Iran**: Urmia, ex flower heads of *Jurinea leptoloba*, 1 ♂, 3 ♀, 28.04.2009 — exit 10.05.2009 (Karimpour) (SIZK).

Comments. This species shows strong differences in the aculeus and glans shape, and has been assigned to the *quadratula* group of species. Here, we consider it together with other species of the *virens* group, as it strongly resembles them in its green live coloration, hyaline wings and moderately small size. Pictures of genitalia are taken from the specimens from Urmia. The first record from Iran and Asia.

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